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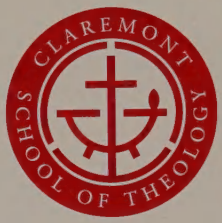

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Plato's Meno

with essays

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Plato's Meno

TRANSLATED BY W. K. C. GUTHRIE

with essays

edited by

Malcolm Brown

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Introduction

During the first twenty-odd years of Plato's life, his home city Athens was at war with Sparta. From his birth around 427 B.C. until the destruction of his city by Spartans in 404 the political ill-health that surrounded him was nearly constant. The war, which was all the more bitter for the fact that Sparta had been an ally of Athens earlier, was nearly constant too. These grim facts had an especially strong effect on the young Plato[1] since

1 Plato's disillusionment with the political intrigues of Athens is recorded in the famous *Seventh Letter* (Bollingen *Collected Dialogues*, pp. 1574 ff.) whose authenticity is a much debated issue. E. R. Dodds' remark is a judicious one here (Plato, *Gorgias, A revised text* [Oxford, 1959], p. 25n.): Even if the letter is not Plato's own, "it is in any case the work of someone who was very well acquainted with Plato's life." The someone need only have been moderately well acquainted with his life to support the very general sketch here.

his family was politically powerful. His uncle Charmides and his mother's cousin Critias were important men in an oligarchic regime (the Thirty Tyrants) that seized power in 404, abolished the courts, put their political enemies to death, and confiscated their property. Plato's relatives were in turn killed a year later when the (democratic) party that had been incompletely purged made a comeback.

Plato reports two incidents in the dialogues, the universal in which is that although it may be important to take a strong moral position in such disturbed times, it is also risky. The incidents are as follows. When an Athenian naval victory at Arginusae in 406 had been marred by the failure of the commanding generals to retrieve some of their dead, a swell of popular emotion rose up in Athens demanding swift reprisals against those responsible. Since due process got in the way of swiftness, the popular passion required that due process be dispensed with. Such an emotional surge, however, reckoned without Socrates, who chanced to be presiding over the Assembly that day (*Apol.* 32B). Although it is not perfectly clear how Socrates proceeded, the handsomest picture of it is the one that E. R. Dodds subscribes to: Socrates was in form that day and was therefore ignorant; he momentarily forgot how one went about putting the matter to a vote. The net result was that the generals got their legal rights, while those hot to kill them wholesale were thwarted. But Socrates' stand against the aroused populace could easily have recoiled against him (as anyone with an eye for universals will see plainly).

A few years later (404–3) the government in which Plato's relatives were involved plotted to kill a certain Leon of Salamis. When the governing group summoned Socrates and four others to its official chamber to instruct them to seize Leon, Socrates took another moral stand. He (and he alone) refused to comply (*Apol.* 32CD). Only the *deus ex machina* ending of the story saved Socrates: the dissident party came back and overpow-

ered their former oppressors, and Socrates' moral stand turned out not to cost him his life (*Apol.* 32D). The extra pungency of this incident would come from the fact that it represented a point-blank confrontation between the Realpolitik of Plato's own blood relatives and the moral-political stand of his beloved teacher.

The third incident, if it can be called that, was final. One has to concede that Socrates did not survive the effort to defend his way of life against Athens, unless one thinks of Plato as saving him through the immortality he granted him in the dialogues. The series of dialogues *Euthyphro, Apology, Crito,* and *Phaedo* tells fully and eloquently about the end of Socrates' life in 399 B.C. All of Plato's dialogues seem to have been written after this date; and one tradition tells that he was still correcting and embellishing them on his deathbed in 347.

Our knowledge, such as it is, of Plato's travels to Sicily is limited by the uncertainty surrounding the authorship (and accuracy) of the *Letters.* The *Seventh Letter,* which most would agree satisfies the weakened requirement of authentic-or-any-way-true, details three such visits, all of them having to do with making kings philosophers or philosophers kings. It indicates that Plato made these trips when he already had the idea that practical politics cannot be reconciled with moral vision until philosophers and kings are made one. He seems to have attached himself to the young monarch Dion of Syracuse and to have won him over to a life of self-control, and thus to habits quite out of harmony with the moral laxity of Sicily in those days. The trip that had this result, among others,[2] was made some time around 388 B.C.

[2] In my own article below (pp. 198–242) I argue that this first visit to Sicily had important effects in the opposite direction; it had intellectual effects on Plato. Plato's meeting the mathematician Archytas may have had effects on the philosopher as important as Dion's meeting Plato had on the king.

Plato seems to have been encouraged, as was Dion himself, by this conversion to see whether the blessing might be "transmissible" to others and especially to young pretenders to the throne. Could one pass on to the younger Dionysius the enthusiasm for truth and virtue, the "spell," as the *Seventh Letter* calls it (333c), of Plato? This was to be the project of the second Sicilian expedition by the philosopher, who claims to have gone this time partly assenting to the arguments of his friend, partly assenting because of the friendship itself, but chiefly out of a concern for his self-respect. In any case, the result was a disaster: so far from converting the young Dionysius to self-control, Plato seems to have been converted by him into a political prisoner; and his host Dion was exiled into the bargain. Thus ended the effort to enchant the young monarch with Platonic education, and Plato went home. This trip seems to have been made in the mid-360s.

His third visit was undertaken somewhere around 361 B.C. on the advice of Archytas and despite the fact that Dion had not been permitted to return from exile in the interval. The result this time was still more catastrophic: instead of making plain to the young king the radical and radically intellectualist conversion he must first undergo before ruling aright, Plato seems to have found himself in an uncomfortable negotiator's position between the exiled Dion and the existing regime, and he did not succeed in pleading the case for Dion. This time the philosopher's status as guest-prisoner was the more uncomfortable in that some of his confinement was in soldiers' quarters and with soldiers for company. Only luck and a 30-oared vessel sent by his friend Archytas seem to have let him escape with his life from this last bit of Syracusan hospitality Plato was to enjoy.[3]

[3] Of the many accounts of Plato's life available, a very judicious one is that of Paul Shorey, *What Plato Said* (Chicago, 1933; reprinted

I

It is not easy to find the point in Plato's dialogues where he stopped socratizing and began platonizing. Aristotle gives us the most reliable guidance[4] when he reviews the teachings of Plato and Socrates in *Metaphysics* I,6 and draws the distinction between them. The gist of Aristotle's report is that, whereas Socrates looked for definitions of universal moral concepts (arguing from cases), Plato, following the Pythagoreans, extended the search and theorized about universals as such, whether moral, mathematical, or other. Plato's orderly world of Ideas is much like the orderly world of Pythagorean numbers. And Plato's theory about how familiar things "have a share of" Ideas (or Forms) is, at bottom, just the Pythagorean theory of how things "imitate" numbers. In short, Socrates did inquiry toward a rational doctrine of ethics; Plato elaborated a doctrine of ethics and also constructed more general theories of (what would later be called) epistemology and metaphysics.

The *Meno* is a reasonable place to locate the dividing line between Socrates and Plato. Socrates is inquiring into the foundations of ethics, the universal concept of virtue, when a puzzle is posed that forces him to put knowledge of virtue alongside knowledge of anything whatever: How is it possible to inquire into anything unknown? This takes one to Platonic ground,

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1968, chap. 2). He gives ample references to previous attempts there. The paperback edition (abridged) of Shorey's book leaves out the references and much of his colorful argument.

[4] I have been influenced by the view of F. M. Cornford (and W. K. C. Guthrie, *J. Hellenic Studies* [1957], reprinted in *Studies in Presocratic Philosophy*, ed. Furley and Allen [New York, 1970], I, 239–254), which favors trusting Aristotle. Cf. Cornford below, pp. 109–110.

namely to the nature of knowledge, inquiry, and reality. The other mark Aristotle's report supplies us with is also conspicuous in the *Meno*: Plato's Socrates begins to speak, as it were, with a Pythagorean accent. He refers to "mysteries" about defining mathematical objects, draws on mathematical definitions to illustrate correct procedure for defining anything, brings in a method of argument he credits to "geometers," and gives the slave-boy a lesson in pure—or, as I argue in my article (see below, pp. 198–242), partly pure—mathematics. Now from what we know of Socrates' intellectual interests from sources wholly or partly independent of Plato (Aristophanes, Xenophon, Aristotle), he seems not to have gone into mathematics, pure or otherwise.

One avoids begging too many questions if he discriminates just three stages in Plato's intellectual development and if he describes them with the nondescript terms "Socratic," "Platonic-I," and "Platonic-II." The articulation between the first two stages has been roughly sketched above. The far more difficult and controversial articulation between the two Platonic stages may now be hazarded, although clearly not with the kind of refined argument which would satisfy Platonic unitarians (One Plato), quick or dead. Again mathematics can serve as the deciding thing. In *Meno*, which divided the first two stages, the mathematical topics intrude themselves into a (presumably) nonmathematical discussion of ethics. The *Theaetetus*, which was pretty certainly written one or two decades later and very likely after the "middle-period" dialogues, *Phaedo*, *Symposium*, *Republic*, bears some striking similarities to the *Meno*. In addition to those listed by Cornford,[5] there is the large-scale similarity in the pair of topics mainly dealt with, knowledge and virtue. In *Theaetetus* the relation of the topics is

[5] *Plato's Theory of Knowledge* (New York, 1957), pp. 27–28.

reversed: its main subject is knowledge, the subordinate one (put into an excursus, 172B–177C) is virtue, whereas in *Meno* it is the topic of knowledge that is excursive (80D–86C). But given the development of Plato's theory of Ideas in the middle dialogues, there is something peculiar about the way knowledge is discussed in *Theaetetus*. Plato here gets on without explicitly bringing in Ideas. This is all the more peculiar in that this characteristically Platonic theory would seem most at home in just this discussion—about knowledge. Efforts have been made, by Cornford and others, to interpret this dialogue and others connected closely to it (e.g., *Parmenides*) consistently with the idea of a unified Plato. I will venture to sketch here, at one paragraph's length and with no pretence of an argument, my own different view.

One can simply suppose that Plato came upon objections to his own characteristic doctrine or, at any rate, to interpretations and explanations that he was compelled to give of it, which caused him to reconsider the doctrine fundamentally. This would be equivalent to supposing that Plato was "not himself" after *Theaetetus* and *Parmenides* (in which Socrates seems to have no answer to criticisms of his understanding of "having a share of"). What are the general features of those dialogues of Plato's late period (*Timaeus, Parmenides, Sophist, Statesman, Philebus*) where one might expect to find signs of Platonic-I but does not? Except for *Timaeus*, which is hard to classify in just about any scheme, these dialogues evidence a new concern about the structure of language and (what would now be called) logical theory, as well as a corresponding shift in the sort of thing under discussion. A pair of illustrations may be permitted to substitute for a more extended discussion of this shift. One typical Platonic-I topic is represented in the question "Are the Idea of Justice and the Idea of each part performing according to its nature the same or different?"

(Republic). In the above-mentioned late dialogues a typical topic is "What is the nature of Same and Different, such that such statements about Justice are possible?" *(Sophist)*. Again, "Does the soul share in life to the exclusion of its opposite death as three in oddness to the exclusion of evenness?" *(Phaedo)*. Compare the Platonic-II questions "What is meant by 'sharing in'?" *(Parmenides)* or "What is exclusion, in real things and in statements?" *(Sophist)*. Two illustrations do not make an argument, but they may serve to indicate what is to be argued. Moral ideas, like mathematical ideas, are especially philosophical in being easily detached from the order of sense. In *Meno* Plato calls for more research in both lines: Gorgias' quick answers about virtue are on a par with those of current mathematicians about irrational sizes. In *Theaetetus* Plato can look back to some real progress in the interim (his own *Republic* and Theaetetus' work on irrationals), even while looking ahead to the later dialogues, and to problems of logical theory that Socrates never dreamed of.[6]

II

The translation of the *Meno* reprinted here was described in *Classical Review* as "very neat as well as accurate, and [it] reads naturally."[7] Such virtues (and what more could one ask of a translation?) explain why it has become the standard

[6] In an article on *Theaetetus* in *Journal of the History of Philosophy*, VII (1969), 359–379, I have argued some of the opinions expressed here. The part of the case which must rest on *Sophist* and *Philebus* I hope to work out later. Glenn R. Morrow, in an article entitled "Plato and the Mathematicians" forthcoming in *Philosophical Review* (LXXIX, 309–333), uses the same standard by which to judge Plato's development: contemporary work in mathematical theory and Plato's series of responses to it.

[7] *Classical Review*, VIII (1958), 36.

English translation, included in the one-volume edition of Plato (*The Collected Dialogues of Plato*). It is also easy to use the present edition along with that one because both give the "Stephanus" page numbers, standard also in Greek texts. These page numbers are regrettably missing in some English versions.

The elucidations that Professor Guthrie offers in his preface (see below, pp. 3–16) cannot fail to be helpful to the teacher and learner (in whichever order) of *Meno*. It is important that the person coming to Plato for the first time *not* labor under the illusion that philosophers write in a cultural vacuum. There were real, live Sophists at large in Socrates' time and in Plato's too, and they were quite capable of poaching on philosophical territory. From certain narrowly philosophical points of view, it may well be irrelevant that Plato pictures Socrates' conversation with Meno as occurring between the Thirty Tyrants incident and his trial in "democratic" Athens, with Anytus as one of the accusers. One maintains such a narrow point of view, however, only at the cost of understanding, and a wiser course is to pay some attention to the context, Sophistical and political.

On the slave-boy experiment, Guthrie's discussion begins, in my judgment, just where it should—with the nearly universal doubt about it in those who read the dialogue for the first time. Was Socrates' interrogation fair, or did it resort to questions "blatantly leading" (cf. p. 11)? And even if it was fair, does the lesson support the momentous consequences (about the soul's ante-natal condition, about recollection) that Plato seems to be attaching to it? On the second question, Guthrie offers the answer that, although Plato may then have been wrongly thinking that all these consequences *did* follow from the experiment, indeed they do not. One only vindicates Plato partly, then, by noticing that later and in other contexts he supplied full-dress, and stronger, arguments for those same convictions.

On the other question—about fairness—one may agree with Guthrie only in believing that the problem of "leading" questions is real and requires answering: one must justify the ways of Socrates to the slave-boy. Now Guthrie sees a certain saving grace in the fact that the boy's right opinions after the lesson are his own, and are more permanent possessions since, "through the cross-questioning method, he has seen for himself" (p. 13). But this criterion of method salvages only the first half of the lesson, which is the only place in it where any refutation goes on. And it leaves to the natural skepticism of students—and to the other skepticism of Plato—the part in which "the answer" suddenly pops up.

I would not want the argument in my own article to stand or fall merely on its ability to "remove the stain" of Socrates' leading questions. Clearly it is a priori possible that, when one looks at the matter the right way, he sees that it is irremediable. But I have argued in my paper from an independent basis (in mathematics) that Plato, in agreement with at least one identifiable Pythagorean, finds arithmetic and arithmetical arguments suitable and a certain kind of geometry and its kind of arguments unsuitable to this kind of lesson with and about a priori knowledge. It is only right for me to report that my argument has not convinced all the experts, nor even all I had hoped beforehand to convince. I have amended various points in response to objections (these are indicated by new footnotes contained in brackets). In the process of defending my conjectures against some of these refutations, I have developed some arguments, one of which I will sketch here.

Socrates replies to the objection of Simmias in the *Phaedo* by first showing him an inconsistency between two of Simmias' own doctrines, "soul is an attunement" and "learning is recollection"; thus he is forced to choose between them. The way this dilemma is handled provides a special insight into Plato and the

Pythagoreans. It gives us light on an issue much more general than reasons for rejecting one Pythagorean tenet (harmony) in favor of another (recollection). Plato has Simmias do the very opposite of what we might expect, given the conventional picture of the Pythagorean disciple. Rather than retreating into mystery or ipsedixitism, Simmias is made to come out into the open, to exhibit the very essence of rationality: he goes back to the arguments in support of each doctrine. But more rational still, he ventures a classification of *types* of argument that will serve to decide between the equally hallowed alternatives. Some arguments, he allows, are based merely on "a sort of plausibility (*eikos ti*) and seemliness" (92D; cf. *Euthydemus* 305E), whereas others are built on solid hypotheses and are thus really proofs. One must be on his guard, he says, against arguments from probabilities, since they are "charlatans" (*aladzones*) powerful to deceive "both in geometry and everywhere else." Such arguments, as a result, "seem right to the multitude" (*ibid.*). Now how are we to make sense of a Pythagorean's deciding to abandon a Pythagorean doctrine on the grounds that the reasoning behind it is deceptive, *like geometry*? Léon Robin found the passage inexplicable: "Simmias reproaches himself with having yielded to the inclination *of the vulgar* toward specious probabilities; but how could geometry illustrate such an inclination? The intention is mysterious."[8] The most natural resolution is that geometry could then represent, and would to an intelligent Pythagorean,[9] the risks of specious

[8] *Phédon*, trans. and ed. Léon Robin, Budé IV, 1, p. 60, n. 1.

[9] Archer-Hind does not give Simmias his due in the unfavorable comparison he draws (*The Phaedo of Plato* [London, 1883], Introduction, pp. *xlv–xlvi*) between him and Cebes. He leaves out of account not only the passage here under discussion, but the very intelligent scheme for proceeding in life without divine revelation (either with knowledge, learned from another or found out for ourselves, or buoyed up by a seaworthy hypothesis, tested by human intelligence) (85CD). Plutarch's *De Genio*

argument; and it would represent it clearly enough that it can help form the general distinction between good and bad arguments, then *applicable* to philosophical cases at hand. Thus defects in one's arguments about the soul could be one case, defects in one's arguments about virtue another. I shall say no more about that article except that I still think it offers a true (if speculative) opinion.

Professor Popper's piece is included not because it comments in detail on the argument of the *Meno*, which it does not, but because it draws attention to Plato's grand intellectual project, of which *Meno* gives only a first glimpse. Exactly in the pattern of the Platonic intellectualist, Popper takes the "case" of Plato's Ideas only for what it is worth in getting to a universal. The universal Popper is after is the same as the one many readers of *Meno* are after, namely, the nature of philosophical problems as such. His main point is that such problems are never understood fully if they are detached from their roots in extra-philosophical areas. No philosophical problem (or at least no live one) is self-generating. The special case Popper explores indeed has special interest to the reader of *Meno*. The philosopher does not geometrize the world—or in any other way intellectualize it—if geometers or analogous minds are

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Socratis represents Simmias as learned in various Pythagorean sciences, and also as familiar with the efforts of contemporary mathematicians (including Eudoxus) to double the cube. This same Simmias is credited there with having co-philosophized with Plato frequently—for example on the moral to be drawn (more study needed) from that geometrical puzzle (578E–579D, Loeb edition *Moralia VII*, 395–399). One cannot be sure (still less Cherniss-sure) about Plutarch's faithfulness here, but since Diogenes Laertius gives titles of twenty-three extant dialogues by Simmias, it would be surprising if Plutarch knew of fewer than these. Many of their titles indicate material anyhow relevant to Plutarch's characterization, especially *On Truth, On Teaching, On Knowing;* but most especially *On Argument* or *Reckoning (Peri Logismou).*

themselves beset by unresolved paradoxes in their own fields. Pythagoreanism could not sustain its claim to have comprehended the world order if it could be continually challenged with paradoxes about "units" and "irrationals" and if it had no answer to these. Once it has been proved that irrational sizes exist (as they conceived it, in space) or that any unit (again, in space) is infinitely subdivisible, it is not hard to prove to the Pythagorean would-be rationalizer of the world order that his rationalization is either partly or wholly irrational. (On the question of the unit, see Popper's note 36 below, p. 158; cf. Anaxagoras, fr. 3.) Similarly if a Socrates is trying to make sense of ethical concepts by a kind of rational inquiry, and if one can prove to him either that some concepts are inaccessible to reasoning or that all of them necessarily are, his rational programme goes up in smoke. The paradox of inquiry that Meno throws up to Socrates, in other words, is as cosmic in its philosophical gravity as the paradoxes dating from Zeno and Hippasus were in their mathematical gravity (see Popper's section VII below, pp. 157–163). It is of course somewhat artificial to think of philosophy and mathematics as merely *analogous* in that old high era and in Plato's vicinity, unless one permits the countervailing artifice according to which the unit is *analogous* to the unit (degenerately).

Popper could be quite wrong in his analysis of Plato's theory (although I believe he is quite right), and he could even be wrong in thinking that *all* philosophical problems come close to this model—and yet there would remain the powerful case he makes for just this kind of vigorous conjecturing about ancient intellectual problems. Or rather, since the vigor of his attack on them prohibits their remaining merely "ancient," about intellectual problems as such. The case he makes by implication is also strong for going "back to" Greek philosophy with some very modern intentions, intending namely to clarify

some contemporary and living problem (e.g., settling one's accounts with Wittgenstein). In this Popper has some common ground with Nietzsche (see below, pp. 96–107).

Cornford's chapter on *Anamnesis* supplies the reader of the *Meno* with some of the dialogue's cultural and Platonic background, against which he can project it before coming to a judgment. The Platonic background is that of the middle dialogues, in which Cornford finds a gradually emerging theory of knowledge: only that counts as knowledge which stands firm against every counterargument and every contrary persuasion. But knowledge in that strict sense would not be possible unless it were knowledge *of* objects of a special sort. "The power of thought has broken through the surface of fleeting appearances and disclosed beyond it an objective 'nature of things' "; to support such an immovable structure of knowledge, the nature of things must itself be immovably firm. Such is the background in Platonic ontology of the *anamnesis* theory. When and where do our souls break through to such an order? We are led to consider a wider cultural setting, the one pointed to by the sign in the text of *Meno* about those "wise men and women" who say rationally defensible things concerning a cosmic wandering of the human soul and concerning the ordered realities it was exposed to there and then. These are the sources in mystery religion that Cornford traces with good reason to the Pythagoreans.

Cornford also defends the Platonic-Pythagorean doctrine he is reviewing and does so in two stages. He argues that we could make no sense of various generally conceded facts about intellectual discovery if we did not credit something like this darkly wise doctrine of latent (more tendentiously, "unconscious") knowledge. This part of the defense will be powerful at least among those who acknowledge the experience of an intellectual illumination. The argument might be strengthened

if one included the testimony of Russell who, when writing about the theory of Ideas, confessed his own experiences of "seeing . . . whole and clear in bright sunshine" the subject he had been studying intensely.[10] To be sure, Russell is very much on his guard against such experiences and says so in the same passage; but this is a far cry from denying their existence, indeed quite the opposite. It does not escape Cornford's notice that the second stage of his defense will fall on some deaf ears, since more arcane matters like an impersonal and discarnate memory and discarnate Forms come in. These features of the Platonic doctrine, first pointed to in *Meno* and later developed in *Phaedo* and elsewhere, go beyond, he concedes, "what would now be commonly admitted." In *Phaedo* Plato returns to these difficult doctrines but not only —nor even first—via rational argumentation. What comes first is "religious eloquence upon the meaning of life and death" (123). Here it is Plato's conviction rather than his power of rational proof on which Cornford puts the emphasis. This last may reflect something of Cornford's own wisdom and idea of it: he never subscribed to the sort of one-sided intellectualism that it is common to associate with the cross-examining Socrates (so Nietzsche in *Birth of Tragedy*). He never conceded that the beginning of wisdom (*principium sapientiae*) is the fear of logic.

The selection from Augustine's *On the Teacher* is offered here as a simulacrum of the *Meno*, whose sameness with and difference from the original are instructive to trace. Except for Augustine's inspired monologue at the end, they are both obviously in dialogue form, in particular the dialogue of opinion and refutation. The warning to Adeodatus against taking the refutations too personally has something in common

[10] Bertrand Russell, *History of Western Philosophy* (New York, 1945), pp. 123 f. Compare the last words of *Problems of Philosophy* (1912): "that union with the universe which constitutes its [the mind's] highest good."

with the *Meno*'s moral about the advantage of being "shocked" by Socratic refutation. The advice not to become a hater of arguments as such (but only of weak ones) reproduces the *Phaedo*'s warnings about "misology." Plato's paradox of inquiry is matched by Augustine's paradox of meaning: so long as we do not know the thing signified by a certain sign, we "completely lack acquaintance with the sign"; but once we get to know the thing, the sign is superfluous. Both dialogues conclude that anyone who professes to teach "the sciences of wisdom and virtue" as one would convey a parcel to someone is deluded. "Those called students consider within themselves whether the truth was spoken [by their teacher], looking, in fact, at that truth within them to the extent they are able" (p. 88) is just another formula for Recollection.

But there are some striking differences. Augustine appeals to the divine authority of the Bible (there is no question here of "giving a reason") and establishes at one stroke doctrines of which Plato is innocent. From *Isaiah* he establishes the impossibility of understanding without faith, and from *St. Matthew* he establishes at once the nonexistence of earthly teachers and the existence (and Unity) of a Heavenly Teacher whose nature is a matter of revelation. From Plato's point of view this form of argument and these conclusions must be left in limbo. On the other hand Augustine dismisses peremptorily (p. 87) the notion that the art of definition can help clear up conceptual confusion.

Augustine's angle of approach is also different. He begins the discussion of teaching by discussing signs, and chiefly words. What and how do they signify? Do some signify themselves? Is it chiefly (or at all) via signs that we may be led to the truth about things, i.e., be taught? The argument veers between two extreme conclusions: that *all* teaching must work through signs, and that *none* of it can. But finally both signs

and their referents are dismissed as merely external; the human mind can learn from neither of them essentially, but only from the illumination of divine truth within. The role of this world's teachers then is at most to prompt in us (recall to us) that light whose nature must remain, in this life at least, a divine mystery.

Leibniz was another metaphysician who felt the attraction of ultimate theological explanations. The first of the chapters left out in the present selection argues that in God alone is our light and refers to *John* I:9, to the Church Fathers, and to scholastic theologians so far as they were non-Averroistic. But at the same time Leibniz was a powerful logician and mathematician, capable of making useful distinctions (clear vs. distinct, idea vs. concept, essential definition vs. causal definition, and so on) on the way to discussing their more mysterious basis. One need only make some allowances for Leibniz' predilection for subject-predicate logic to apply usefully what he says about "suppositive" knowledge to the *Meno*'s "method of hypothesis." In both cases, one's knowledge remains inadequate so long as it continues to include a supposititious or hypothetical remainder, and, in both cases, it turns out to be illusion rather than knowledge if ever a contradiction that was at first implicit is explicated during the analysis. The method of hypothesis (or supposition) is perfectly true even when leading to falsehoods. Indeed if it leads one to recognize for falsehoods what he had supposed confidently to be true, i.e., if it leads to an *aporia* which in turn leads to new inquiries, it is both true and very useful, for it is guiding us to *to saphes* (clarity). See *Meno* 100B.

Leibniz takes the lesson with the boy to be essentially about the "extremely difficult" matter of incommensurability, not about the (relatively easy) doubling of the square. But this has the effect of turning the lesson around. On this reading the answer "this one" is not the essential thing at all, but rather

"until we get clear about fundamentals, we must expect no answer at all." Although Leibniz does not say so, since he was an expert mathematician, clearly he knew that "possessing the idea upon which those truths [about incommensurability] depend" has little to do with squares or anything one can draw pictures of and much to do with ideas like "9 is not the same as 8" and "whatever implies that 9 is the same as 8, or any other absurdity, is always false, never true." However ideas like these got into the souls of the slave-boy and Socrates (and Gorgias and the rest of us), it is not so easy to say; it is to the credit of Plato, Leibniz, and some others that they tried to say it nonetheless.

Professor Stahl's article performs a detailed exegesis of the argument of the dialogue following the slave-boy passage. His intent is to clarify the new method announced there by Socrates, his "artful device" taken over from the mathematicians for knitting together his own and Meno's questions so as to make any answer to one (Meno's) depend on an answer to the other (Socrates'). What Stahl brings to light about "one-way" and "two-way" implications in the dialogue is important for our understanding of Plato and the mathematicians. It is also important for appraising Plato's contributions to logic. Plato is here employing, and to a certain extent reflecting on, argument schemata which are hospitable, not to terms or classes, but to propositions. Whatever led Aristotle, the progenitor of formal logic, away from further research in this direction (it is quite plausible that Plato did it), he seems anyhow to have been led away from it. If one is to disagree (or agree) intelligently with Ryle's opinion that Plato wrote "at the dawn of philosophy and before the dawn of logic,"[11] he ought to consider the studies of Mates and Robinson that Stahl refers to, as well as the present piece by Stahl.

[11] Gilbert Ryle, "If Plato Only Knew," *New York Review of Books* (November 6, 1969), p. 19.

Finally, it is always profitable for students of Plato to see exhibited with such clarity and precision the argument forms underlying a dialogue's philosophical reasoning. All the more profitable when the forms brought to light are propositional forms with the kind of intrinsic value native to "if/then's" and "not's." It should be noted that Stahl's firm refutations of the standard neo-Kantian interpretations of *Meno* do not imply either that Plato was not akin to Kant epistemologically or that Stahl believes that he was not. On this last point one must consult further his full article in *Hermes*, 1960.

Aristotle tackles a problem familiar to all readers of the *Meno* when he asks himself about happiness, and therefore about virtue: "Is it taught, or does it come from living and being trained, or by a divine dispensation or chance?" (*Nichomachean Ethics* I,9). He rules out divine gift on procedural grounds (this is better handled in theology), and he rules out chance on the argument that this would be an unnatural arrangement. He is left, then, with the trim dilemma, "Is virtue a matter of teaching or training?" Now deciding between these two alternatives meant taking a position on one of the topics of the day. If teaching is construed to mean only the highly intellectual thing it meant at Plato's Academy, then Sophistic education must be understood as part of the "training" alternative. But Aristotle declines to take sides;[12] he answers that, natural handicaps aside, virtue is got by *both* teaching (*mathesis ti*) and diligence (*epimeleia*) (*ibid.*).

12 A related dilemma, about reality as known, is formed by Plato in the *Sophist:* Is the Real the same as the Changeless or the Changing? Since knowing is a kind of doing (*poiein ti;* 248DE), what is known must be able to be a "thing done" without thereby losing its reality. Circles, pyramids, and cones, therefore, as known by Eudoxus, Menaechmus, and their group, are real even if "produced" in their arguments. On the other hand, Speusippus, Amphinomus, and their group are right to caution that these "doings" are not *all* there is to these *mathemata.* Thus a reality in which life and learning go on must consist of *both* changeless and changing things (249D).

Ryle is similarly unwilling to take sides as between teaching (of propositions) and training (of "habits"). We learn to do this or that (including even arithmetic and such immaterial things) by being put through the appropriate paces, first by another and then by ourselves. But to put another or himself through paces requires that one be methodical, systematic. System is what insures that later performances improve upon earlier; it involves the learner's recognizing something more universal than just this act, or even this mistake. To get our performances in line, we must recognize the line proper as well as our strayings from it. But the right paces or the right line for *this* performance are not necessarily right for every other. Methods are both plural and changeable.[13] A key point in Ryle's account is the necessity of correcting our errors and, therefore, of having actually made some errors. But this in turn requires that we have done (in a systematic way) some trying.

Some of Ryle's arguments are reminiscent of Socratic "inductions": beginning with plain cases like learning to spell or swim or box, he extracts a general message about learning. The general result can then be applied to more difficult cases, such as learning to handle verbs and conjunctions and to think philosophically. Now Socrates is sometimes criticized for working his inductions too hard, for applying results he has extracted from certain plain cases of learnable-practiceable arts to quite remote cases. One way to learn from Ryle's arguments is to try out one's powers of counterpunching on them.

Ryle, like Aristotle, is at odds with Socrates and Plato about the hypothesis that virtue is a certain kind of insight, transmissible via propositions or some other purely intellectual medium. He agrees with Aristotle in refusing to credit the

[13] Cf. Karl Popper's thesis that we learn from (and only from) our mistakes (*Conjectures and Refutations*, Preface to 2nd edition [New York, 1965], p. ix).

teaching-or-training dilemma and, therefore, refusing to be forced either into an intellectualist doctrine of teaching or into an anti-intellectualist doctrine of training. In his modes of operating, however, he has much in common with Socrates. He is a believer in arguments from plain examples (*epagoge*) and in the instructive art of elenctic exchanges. He is a practitioner, as well as a theorist, of the art of "hitting hard and often."

One might expect Nietzsche's lectures on Plato to do little else than express hostility to him as collaborator with Socrates in laying the foundations of idealism. They do in fact do some of this, but they do important other things, too. For example (1) they sketch *sine ira et studio* the arguments from knowing and sensing that led Plato to his philosophy of real being behind appearances; (2) they analyze dispassionately Plato's antagonism to both Sophists and the moral assumptions of "the elders"; (3) they analyze Plato's concept of *arete*, both in general and in special relation to the soul; and (4) they examine the distinctions between the virtue which is knowledge and that which "lacks insight into the essence of virtue," and they show how this applies, via *Meno*, to the antagonism between Plato and the Sophists.

Hostility to Plato's character and program is not absent. Although he distinguishes the temperament and personal characteristics of Plato from his philosophical program, Nietzsche does not disconnect them: the first explains the second.[14] Thus

[14] The search for individual temperament and motive beneath the surface of a philosophical doctrine is not an exclusively Nietzschean habit. Guthrie, for example, says of the Presocratics that "their philosophies are the outcome of contrasting temperaments (as, perhaps, are all philosophies)" (*History of Greek Philosophy* [Cambridge, 1965], II, xiii). And he applies this remark to one of Nietzsche's favorite cases (Empedocles) further on (pp. 122 ff.). It is a point Guthrie has taken over from Cornford; and although its origin and final aim differ widely from that of Popper, nonetheless its general form does not.

he sees the program in all its essentials in the figure of the "Perfect (Complete) Philosopher," in which, in turn, he sees Plato himself. But Nietzsche's hostility has some surprising features. It is *not* based on the expected reasons.[15] He attacks Plato's *philotimia* (roughly: his will to power), and he warns against the "fanatical" tendencies of those who "believe unconditionally in themselves." He is most alarmed at the contempt for humans and human institutions, which Plato is ready to overturn in favor of a new type of man ("the Perfect Philosopher"). But are not Plato's intentions Nietzschean: condemning men and their traditions as "all-to-human"? Are his "radical" alternatives not a "higher man" and a "new nobility" who can rule only given some "transvaluation of all inherited values," thus who appear to the contemporary view to be "untimely"? In short, Nietzsche seems to be recoiling from Plato's vision on account of its radical tendency, and this response is more characteristic of a liberal than of a fellow radical.

Professor Andic's essay appears here for the first time, and I shall leave it to judicious readers to judge its substance. But I may be permitted to notice some of its virtues of method. Professor Gosling has rightly noted two errors of method not easily avoided by interpreters of Plato. He describes the two opposite errors as follows: (1) giving us "a Plato whose naivetes are really enigmatic insights forestalling Kant, Frege, Russell and the rest," or (2) deciding that, since Plato lived so long ago, any interpretation "which attributes an inanity *ipso facto* gains in plausibility."[16] The wise course, he concludes, is to avoid either "the Frege or the Simple Simon" view of Plato. Now un-

[15] E. R. Dodds has shown clear resemblances between Nietzsche and the character Callicles in the *Gorgias* (*Gorgias*, Appendix). But the basis for Callicles' contempt for Socrates (and Plato) is their idealistic preference of self-restraining virtues to injustice, license, and the unscrupulous pursuit of power.

[16] J. Gosling, "Review of Crombie's *An Examination of Plato's Doctrines*," MIND, LXXIV (1965), 105–116, esp. 105–106.

questionably Andic's paper steers nearer to the Frege danger, as for example when he touches on subtle questions like the requirements of univocal predication. But he is careful to limit his excursions into contemporary issues, and keeps his interpretation controlled by parallel arguments in the dialogues, as for example the puzzle about an expert's knowledge consisting only in an awareness of which things he does and does not know. There can be no harm in suggesting that Plato is reaching in *Meno* (and *Theaetetus*) for subtle matters like "networks of definition" so long as it does not escape one's notice (as it does not escape Andic's) that Plato also struggled over plainer matters like the difference between someone's knowing that he does not know something and his knowing the something that he does not know.

One more thing: however the judgment may go on this paper's substance, it will be hard to deny its virtue as an instrument of research. Its interpretations are built upon carefully formulated rehearsals of Plato's arguments, and its supporting arguments are very fully documented in footnotes. A good bibliography on this dialogue can be extracted from these footnotes, as well as better than average bibliographies on several related topics. Whether one agrees or disagrees with a given point in Andic's interpretation, he will have plenty to work with in giving his reasons. And in the process he will have been driven back to the *Meno* and other dialogues, often with a sharpened appreciation of their arguments.

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Textual note

The MENO *is reprinted by permission from* PLATO, PROTAGORAS AND MENO *(Harmondsworth: Penguin Books Ltd., 1956) translated and edited by W. K. C. Guthrie. The translator's preface is Professor Guthrie's, also reprinted by permission from the Penguin Books edition. Spelling and punctuation have, to some degree, been revised to conform to American usage.*

The commentary consists of selections from classical philosophical works or articles, either reprinted from journals, or, in the case of Martin Andic's article, printed here for the first time. Joel Lidov's translation of selections from St. Augustine's ON THE TEACHER *and Malcolm Brown and Gertrud Weiler's translation of selections from Friedrich Nietzsche's* INTRODUCTION TO THE STUDY OF THE PLATONIC DIALOGUES, *as well as Mrs. Weiler's translation of the article by H.-P. Stahl, all appear here for the first time. In addition, new footnotes (designated by asterisks and appearing in brackets) have been added by Malcolm Brown to his article. Errors were corrected in the reprinted articles, and minor changes made for consistency in footnote styling; any other editorial additions are in brackets.*

The Meno

Translator's preface

Dramatic date

The introduction of Anytus and Socrates's reference to his important position in the state show that the conversation is supposed to take place after the restoration of the democracy in 403. On the other hand, Meno joined the expedition of Cyrus (the *Anabasis* of Xenophon) in March 401, and never returned from it. We may therefore place the conversation in 402, some thirty years later than the meeting described in the *Protagoras*. Socrates is already in his late sixties, and his trial and condemnation are drawing near.

Speakers in the dialogue

Socrates.

Meno. The character of Meno as a wealthy, handsome, and imperious young aristocrat, visiting Athens from his native Thessaly, is well brought out in the dialogue itself. He is a friend of Aristippus, the head of the Aleuadae who were the ruling family in Thessaly, and his own family are *xenoi* (hereditary guest-friends) of the Persian king, a tie which must have dated from the time of Xerxes, who made use of Thessalian hospitality on his expedition against Greece. He knows the famous Sophist and rhetorician Gorgias, who had stayed at Larissa in Thessaly as well as meeting him in Athens. From Gorgias he has acquired a taste for the intellectual questions of the day, as seen through the eyes of the Sophists, whose trick question about the impossibility of knowledge comes readily to his lips.

Xenophon tells of his career as one of the Greek mercenaries of Cyrus and gives him a bad character, describing him as greedy, power-loving, and incapable of understanding the meaning of friendship. This account is probably prejudiced by Xenophon's admiration for the Greek leader Clearchus, a grim and hardly likeable character, whose rival and personal enemy Meno was. There were rumors that Meno entered into treacherous relations with the Great King, but he appears to have been finally put to death by him after the failure of the expedition, though possibly later than his fellow-prisoners.

Anytus. A prominent Athenian democrat in the last stages of the Peloponnesian War, exiled by the Thirty in 404, and in the next year an ally of Thrasybulus in the restoration of the democracy. One of the accusers of Socrates at his trial in 399,

a fact of which Plato makes effective dramatic use both in the episode in which he takes part and in the final words of Socrates to Meno.

A Slave of Meno.

Summary

Meno asks Socrates how 'virtue' (*arete*) is acquired, whether by instruction or in some other way. Socrates replies that he cannot answer, because he does not yet know what it is. (We notice that this opening remark of Socrates is that with which he ended his discussion with Protagoras.) Meno is surprised; *he* can tell him what it is, and proceeds to do so by saying that there are different kinds for different people and enumerating them. Socrates points out that since all these are called by the same name they presumably have something in common, and suggests that it is this 'something in common' which they must look for if they are going to say what virtue is as such. Meno is eventually brought to agree, and proposes a definition ('the capacity to govern men') which Socrates demolishes. He then demonstrates by means of the examples *shape* and *color* the kind of general definition that he wants. Meno tries again and is again put to confusion. His new definition, that virtue is 'the desire of fine—or good—things and the power to acquire them,' will not do because (*a*) everyone in fact desires what is good, (*b*) the power of obtaining good things is only virtuous if we add 'justly but not unjustly.' Since justice has already been agreed to be a part of virtue, we are going round in a circle.

At this point Meno utters his despairing protest that the whole effect of Socrates's conversation is to induce numbness of the brain in his interlocutor and deprive him of the power of coherent thought. Socrates excuses himself by saying that

at least he does not do this intentionally, from the position of one who knows, deliberately confusing a fellow-being who is seeking knowledge. So in this matter of virtue, he does not know what it is, and all that he has done is to show that Meno too, although he wrongly thought he knew, is in the same position. Now that both of them have admitted their ignorance, they can better co-operate in a joint effort to find the answer to their question.

This prompts Meno, by a natural turn in the conversation, to propound a sophistic dilemma about knowledge. One can never find out anything new: either one knows it already, in which case there is no need to find it out, or else one does not, and in that case there is no means of recognizing it when found. It is as a way out of this dilemma that Socrates propounds the theory of knowledge as recollection. This is bound up, he says, with the doctrine of certain religious teachers that the human soul is immortal. It does not perish at death, but migrates elsewhere, and in due course is born again in a new body. In the course of its wanderings, both here and in another world, it has learned all there is to know, the more easily because 'all nature is akin.' In this life therefore it is possible, starting from something which we consciously know, to be reminded of all the rest of the knowledge which is stored latent in our minds, and this is the real nature of the process which is commonly called learning. Meno asks for a demonstration that this is so, and there follows the experiment with the young slave, who though ignorant of mathematics is made by Socrates to solve a mathematical problem assisted only by questioning. Socrates claims that in this experiment he has not told the slave anything, but only, by his questions, elicited knowledge which must have been in the boy's mind, although he had hitherto been unaware that he possessed it.

At the end of this episode, Socrates disclaims certainty for

every detail of the doctrine, but reiterates his conviction that it is not a hopeless task to seek diligently for knowledge which we do not believe ourselves to possess, and far better than weakly giving up the quest. He asks Meno therefore to resume their inquiry into the real nature of virtue.

Meno agrees, but says that he would much rather discuss his original question: can virtue be taught or not? Socrates protests once more that this is to invert the logical order—one ought not to ask whether a thing has a particular accidental quality before determining its essential nature—but consents on condition that Meno will allow him to proceed by means of a hypothesis about the nature of virtue. We say to ourselves, 'If virtue is teachable it must be x,' and ask ourselves what value of x will satisfy the condition. The obvious answer is that it must be knowledge. Meno's original question, then, will be answered if we can find out whether virtue is knowledge or not.

By a brief argument on lines familiar from the *Protagoras*, Socrates convinces Meno that it is logical to identify virtue with knowledge. He now, however, raises a new difficulty himself. This may be right in theory, but does practical experience bear it out? If something so important can be imparted by teaching, presumably there exist teachers of it, and pupils learning it; but Socrates has never been able to find any. However, here, by great good fortune, comes Anytus. He is the kind of man who ought to be able to help us on this point.

There follows an interlude which contains the only reference in the dialogue to the Sophists as a class. In contrast to the part they play in the *Protagoras*, the introduction of their claims here comes simply as a short interruption of the main argument, which is resumed after dismissing them. The profession of the Sophists to teach *arete* is a subject which Plato has dealt with elsewhere, and here he is after something different. Socrates suggests to Anytus that perhaps they may find the

teachers they are looking for in the Sophists. Anytus replies by abusing them as dishonest quacks, and takes his departure with a not very veiled threat against Socrates, whom he was before long to bring to trial.

Continuing their discussion, Socrates and Meno conclude that the position of the Sophists seems to be too dubious for them to be acclaimed with any confidence as real teachers of virtue. It is strange: there appear to be grounds for doubt whether in practice it ever is taught: perhaps there was a flaw in the theoretical proof. We said that because virtue always led to right conduct, it must be knowledge: but we may have been mistaken in overlooking the claims of right opinion, which so long as a man possesses it may serve him as well, for practical purposes, as knowledge in the full sense. By means of an illustration Socrates explains the difference between the two. Briefly, right opinion is something that you take on trust, and is converted into knowledge only when you have worked out the explanation for yourself and understand the reason why it is true. You then have it, as it were, no longer at second-hand, and true opinion is to be contrasted with knowledge as second-hand information (e.g., when somebody is told the way to Larissa) with direct experience (of the man who has traversed the road himself).

The defects of right opinion as opposed to knowledge are its instability and impermanence and its mysterious origin, which makes it sometimes impossible for one man to impart it to another. The point (familiar from the *Protagoras*) about great statesmen not being able to pass on their virtue to their sons is made once more, and Socrates concludes from it that what constitutes their virtue cannot after all be knowledge, but only this mysterious right opinion or conjecture, in fact a kind of intuition. That seems to put them in the same class with poets and seers as men who excel by a sort of divine inspira-

tion. This then is the conclusion to which the discussion apparently leads, namely that virtue is not something imparted by teaching, but simply comes to a man 'by divine dispensation without taking thought'; but Socrates ends, as in the *Protagoras*, by repeating his warning that they cannot truly know how virtue is acquired without first going thoroughly into the question of its essential nature; and this they have not done. There is a long road still to travel, and Plato takes it in the *Republic*.

The geometrical experiment with Meno's slave

The question that springs to the mind of most people on first reading this section of the dialogue is: has Socrates's interrogation been fairly conducted, and does it really prove what Socrates seems to think it does, namely the ante-natal existence of the soul, which, at least at the beginning, he seems to regard as bound up with the whole religious doctrine of immortality and reincarnation? If however we take the experiment in its context, it is a different question that is of immediate importance to Socrates. The experiment is introduced because the major discussion has been held up by Meno's employment of the eristic argument against the usefulness of pursuing any philosophic or scientific inquiry at all; and the essential thing is to show that the argument is not valid, but that it is worth while seeking knowledge of the nature of virtue, or anything else, which one does not possess at the moment.

Leaving then until later the question whether the acquisition of knowledge is in reality the recollection of truths known before birth, what has been achieved by the demonstration? By making the experiment under controlled conditions of his own choosing, Socrates has been able to construct a working model

of his own method of discussion, which will give to Meno, who has up till now regarded it as a form of mental torment, an unmistakable impression of its advantages. With this in mind, he makes explicit references back to their own discussion, to show how it corresponds to the model and what stage in the Socratic process he and Meno have now reached.

The first stage is the confident assertion that comes from complete ignorance, mistaken by its possessor for knowledge. The slave says without hesitation that 'obviously' the double square will have a double side. Similarly Meno, when asked what virtue is, had said 'That's easy.' Socrates pauses (82E) to point out to Meno that this is the boy's condition, having selected a subject of inquiry in which Meno will have no difficulty in seeing at once not only the boy's conviction of knowledge but also his actual ignorance of the truth.

Next the boy is shown that his first answer was wrong, and is reduced to a helpless confession of ignorance (84A). Here Socrates breaks off again to make Meno admit that this is a better state than the first. In the controlled experiment that is obvious, though when the same technique was applied to Meno he had complained bitterly. Socrates refers explicitly to Meno's comparison of him to the sting-ray, and rallies him on his claim to have held forth admirably on virtue in the past. The value of the Socratic elenchus (as this part of the process is called) is that it (a) clears away the conceit of false knowledge and (b) instils the desire to learn as a natural consequence of coming to realize one's ignorance.

At this point in the main discussion, progress was barred by the eristic objection that no man can seek to find out something that he does not know, because he will have no means of recognizing it when found. In the experiment, the same point marks the beginning of the second phase of Socratic interrogation, the phase which entitles it to be called, as he calls it in the *Theaetetus*, mental midwifery. His questions bring into the

light of day ideas which were latent in the other's mind, or to use his own metaphor, they assist the delivery of ideas with which the other was pregnant. It is this positive stage that puts the greatest strain on a reader's credulity, at least if he is expected to regard it as proof that we unconsciously possess knowledge all the time, having acquired it in a previous, discarnate state. But we may fairly consider the following points:

1. In a way the slave did already possess the right answers somewhere in his mind, otherwise he could not have given genuine assent to the alternative which at each stage Socrates puts before him—could not, as we should put it, have 'seen' that the suggested answer is right and others wrong. Even if we think Socrates's questions are blatantly leading, we must in fairness believe that the boy does do this, i.e., that he does not say yes simply to please Socrates, but because he realizes that it is the obvious answer. We may do so the more readily, because any person of ordinary intelligence would in fact realize it. What shows him his errors, and the right answers, is not so much Socrates's questions as the diagrams themselves. When the square on the three-foot side is drawn, he can see at once that it contains nine square feet, not eight. Similarly when the diagonals are drawn, he can see without Socrates telling him that the part cut off by each is the exact half of one of the squares. Moreover it would be possible, given time, for anyone to draw these diagrams, and learn the truth from them, for himself without an instructor. In his book *Before and after Socrates* Cornford quotes the anecdote about Pascal, whose father refused to allow him to learn geometry. (If not true, it is enough that it could be true.) In his own room, the boy drew figures on the floor with charcoal, without even knowing the proper names to apply to them, made out his own axioms and definitions, and had reached the thirty-second proposition of the first book of Euclid before he was discovered.

What the experiment teaches could be expressed as the difference between empirical and a priori knowledge, the one referring to the natural, changeable world in which we live, and the other to universal and timeless truths; and it suggests that whereas we have to learn facts of the former kind either from our own experience of the outside world or on the authority of another, the latter type of truth does seem in some way to come up from inside us so that we can work it out for ourselves. The date of a historical event, or the chemical formula for water, are things that we simply have to be told. Not so the truths of mathematics (nor, in Plato's belief, of morals). No doubt the two halves of the visible square, when Socrates had roughly sketched it out with a stick in the sand and ploughed a diagonal across it, were *not* precisely equal. Yet the slave replies with confidence—and this time rightly—that they are, because he knows (without being told by anyone) that the question refers not to this particular square but to the universal, mathematical concept of a square. It is, as Plato would say, a truth of the intelligible, not of the sensible world; and it is this kind of truth that he conceives of as being acquired by recollection. Mathematics in Greece, though elementary compared with their modern counterpart, had advanced sufficiently to make this duality plain to Plato. Today it is even plainer: $\sqrt{-1}$ is something the like of which we never meet in this world. Common-sense, and the elementary type of mathematics that deals mostly in common-sense arguments, tells us that when a number is multiplied by itself the product must always be positive, so that any square number must be a positive and not a minus one. Yet mathematicians work happily with the idea that -1 can have a square root, and it yields them intelligible results. How do we have any knowledge of $\sqrt{-1}$? Plato would say that since it is not exemplified in anything that we experience in this life, and is indeed contradicted by experience, we must have encountered

it among the eternal truths with which our disembodied intelligence was face to face before birth.

2. The educational value of the Socratic method should also be appreciated. Whatever we may think about the claim that the boy already had these right opinions about geometry lying hidden in his mind before the conversation, there is no doubt that they are genuinely his opinions now. A less gifted, or less patient, teacher might say straight away: 'Now learn this and don't forget it: to draw a square double the size of a given square, you draw it on the diagonal of that square.' The pupil would dutifully repeat this, but he would not *know* it in the sense in which Socrates (and we also) understand knowledge. Unless he can remember that particular sentence, he will forget the truth that it expresses, and in any case, if someone else tells him something different, he may as easily believe that. But the slave's opinion will not now be so easily shaken. Through the cross-questioning method he has seen for himself that it is so, almost as much as if, like the young Pascal, he had discovered it completely unaided. He has seen that neither a double side nor a side 1½ times as long gives the desired result, and he has a mental picture of how the true double square is built up from four half squares. He is on the way to being able to 'give an account,' to explain and defend his beliefs. This is a lesson of permanent value for teachers and it is still very imperfectly learned.

3. To appreciate the episode justly, we must also take into account Socrates' concluding words at 86BC. He clearly disclaims certainty for some of what he has been saying, though scholars have differed as to how much. There is no reason why we should not take his words at their face value. The one thing that he claims to feel sure of is that the eristic argument against inquiry is false. The quest for new knowledge is not a hopeless

one, and to believe the contrary is positively harmful. So much he claims to have demonstrated, and the natural conclusion from his words is that he does not think he has substantiated either the full religious doctrine from which he set out—the priestly tale about immortality and reincarnation—or even the theory that learning is the recollection of ante-natal knowledge. This modest summing-up is more in accordance with our own impression of the experiment as well as being a justifiable inference from the words.

We must, however, beware of supposing that, if Plato is too clear a thinker to believe that what he has said here is full proof of the religious doctrines, therefore he did not believe them to be true. Other dialogues show that he took them seriously and was firmly convinced of the soul's immortality. The *Phaedo*, *Phaedrus*, and other works leave no reasonable doubt that he believed in the cycle of births as well. In the *Phaedo*, which there are good reasons for thinking was written later than the *Meno*, the theory of recollection is brought into connexion with immortality and used as a partial proof of it. Here on the other hand the point at issue is the practical one of showing that new knowledge can be acquired, and so allowing the main discussion about virtue to proceed. He has not yet satisfied himself as to the rational proofs of immortality, and puts off that problem to the time when he can devote a dialogue to it as his main topic.

4. One thing more should be noted before we leave the experiment: that is, the first appearance of 'opinion' or 'belief' (Greek *doxa*) as an intermediate stage between sheer ignorance and knowledge, a conception which acquires great importance later in the dialogue. The eristic dilemma, like all dilemmas, presented a simple 'either-or.' It assumed only two alternatives: either one knows something or one does not. The recollection-theory evades it by recognizing a process, with several stages,

between blank ignorance and complete knowledge. Blank ignorance indeed, in the sense that the mind is a complete *tabula rasa*, is something that we never suffer from. Not even at birth does it resemble a sheet of paper on which nothing has been written. Rather, we might say, there is writing on it in invisible ink which only needs the proper reagent to make it perceptible. Thus the true stages in the progress of knowledge are: (i) unconscious knowledge, (ii) opinion or belief, (iii) conversion of opinion into knowledge.

(i) The theory holds that knowledge of a certain kind may be present in our minds without our being consciously aware of it or having been aware of it since birth. The antecedent possibility of such a state of mind may be illustrated from the familiar experience of ordinary forgetfulness, as when we cannot say the name of an acquaintance yet know enough to reject wrong suggestions and recognize the right one when it is put to us. Plato's metaphor of mental 'pregnancy' and 'midwifery' refers to the same thing.

(ii) This unconscious knowledge when first awakened by questioning cannot yet be called knowledge in the full sense. Psychologically it is only opinion or belief (*doxa*). This word Plato, who avoids the precision of technical terms, uses in two different ways. In the first place it is an as yet imperfectly conscious and unco-ordinated cognition of the same eternal truths which are the objects of knowledge. This is the state of mind of the slave when Socrates has finished his questioning and so brought him to a 'true opinion' about a mathematical problem. The opinion is genuinely his own, as it would not have been had he simply been told the answer with the questioning process omitted; but it is not yet firmly and impregnably established in his mind as cognition must be to deserve the name of knowledge. So to establish it would necessitate several repetitions of the process. The difference is one of degree of cognition

only; the object of cognition is the same whether it is opinion or knowledge.

In the second place *doxa* is applied by Plato to what we should call knowledge of the sensible world, including all natural science however securely based on inductive evidence or so-called laws of nature. In his view there can be no 'knowledge' of that, since the natural world is constantly changing. One of his criteria for knowledge is that it should be stable and lasting, which it can only be if its objects are stable and unchanging themselves. Concerning the changing world of experience, therefore, we can only have opinion or belief.

Besides the insecurity of opinion, another difference between the two is that our minds can contain false opinions, whereas knowledge must be true or it is not knowledge. The slave at first believed that the double square must have a double side. These false beliefs have to be disproved by being shown to be inconsistent with other beliefs that one is willing to accept as more certain. The problem of how the mind can entertain false beliefs is not here considered by Plato. He faces it in later dialogues, particularly the *Theaetetus* and *Sophist*.

(iii) Lastly comes the conversion of true opinion into knowledge. This, says Socrates, will happen in the case of the slave when he has been put through the demonstration many times and in different ways, until he carries immovably in his mind how each proposition necessarily follows from others which he has seen to be true. This is what is described later in the dialogue as 'tethering' or securing the opinion by a full working out of the reasons for it.

The Meno

MENO. Can you tell me Socrates—is virtue something that can 70
be taught? Or does it come by practice? Or is it neither teaching
nor practice that gives it to a man but natural aptitude or some-
thing else?

SOCRATES. Well Meno, in the old days the Thessalians had
a great reputation among the Greeks for their wealth and their
horsemanship. Now it seems they are philosophers as well— B
especially the men of Larissa, where your friend Aristippus
comes from. It is Gorgias who has done it. He went to that city
and captured the hearts of the foremost of the Aleuadae for his
wisdom (among them your own admirer Aristippus), not to
speak of other leading Thessalians. In particular he got you
into the habit of answering any question you might be asked,
with the confidence and dignity appropriate to those who know

C the answers, just as he himself invites questions of every kind from anyone in the Greek world who wishes to ask, and never fails to answer them. But here at Athens, my dear Meno, it is just the reverse. There is a dearth of wisdom, and it looks as if
71 it had migrated from our part of the country to yours. At any rate if you put your question to any of our people, they will all alike laugh and say: 'You must think I am singularly fortunate, to know whether virtue can be taught or how it is acquired. The fact is that far from knowing whether it can be taught, I have no idea what virtue itself is.'

B That is my own case. I share the poverty of my fellow-countrymen in this respect, and confess to my shame that I have no knowledge about virtue at all. And how can I know a property of something when I don't even know what it is? Do you suppose that somebody entirely ignorant who Meno is could say whether he is handsome and rich and well-born or the reverse? Is that possible, do you think?

MENO. No. But is this true about yourself, Socrates, that
C you don't even know what virtue is? Is this the report that we are to take home about you?

SOCRATES. Not only that; you may say also that, to the best of my belief, I have never yet met anyone who did know.

MENO. What! Didn't you meet Gorgias when he was here?

SOCRATES. Yes.

MENO. And you still didn't think he knew?

SOCRATES. I'm a forgetful sort of person, and I can't say just now what I thought at the time. Probably he did know, and I expect you know what he used to say about it. So remind me
D what it was, or tell me yourself if you will. No doubt you agree with him.

MENO. Yes I do.

SOCRATES. Then let's leave him out of it, since after all he isn't here. What do you yourself say virtue is? I do ask you in

all earnestness not to refuse me, but to speak out. I shall be only too happy to be proved wrong if you and Gorgias turn out to know this, although I said I had never met anyone who did.

MENO. But there is no difficulty about it. First of all, if it is E
manly virtue you are after, it is easy to see that the virtue of a man consists in managing the city's affairs capably, and so that he will help his friends and injure his foes while taking care to come to no harm himself. Or if you want a woman's virtue, that is easily described. She must be a good housewife, careful with her stores and obedient to her husband. Then there is another virtue for a child, male or female, and another for an old man, free or slave as you like; and a great many more kinds of 72
virtue, so that no one need be at a loss to say what it is. For every act and every time of life, with reference to each separate function, there is a virtue for each one of us, and similarly, I should say, a vice.

SOCRATES. I seem to be in luck. I wanted one virtue and I find that you have a whole swarm of virtues to offer. But seriously, to carry on this metaphor of the swarm, suppose I asked B
you what a bee is, what is its essential nature, and you replied that bees were of many different kinds, what would you say if I went on to ask: 'And is it in being bees that they are many and various and different from one another? Or would you agree that it is not in this respect that they differ, but in something else, some other quality like size or beauty?'

MENO. I should say that in so far as they are bees, they don't differ from one another at all.

SOCRATES. Suppose I then continued: 'Well, this is just C
what I want you to tell me. What is that character in respect of which they don't differ at all, but are all the same?' I presume you would have something to say?

MENO. I should.

SOCRATES. Then do the same with the virtues. Even if they

are many and various, yet at least they all have some common character which makes them virtues. That is what ought to be kept in view by anyone who answers the question: 'What is
D virtue?' Do you follow me?

MENO. I think I do, but I don't yet really grasp the question as I should wish.

SOCRATES. Well, does this apply in your mind only to virtue, that there is a different one for a man and a woman and the rest? Is it the same with health and size and strength, or has health the same character everywhere, if it is health,
E whether it be in a man or any other creature?

MENO. I agree that health is the same in a man or in a woman.

SOCRATES. And what about size and strength? If a woman is strong, will it be the same thing, the same strength, that makes her strong? My meaning is that in its character as strength, it is no different, whether it be in a man or in a woman. Or do you think it is?

MENO. No.

73 SOCRATES. And will virtue differ, in its character as virtue, whether it be in a child or an old man, a woman or a man?

MENO. I somehow feel that this is not on the same level as the other cases.

SOCRATES. Well then, didn't you say that a man's virtue lay in directing the city well, and a woman's in directing her household well?

MENO. Yes.

SOCRATES. And is it possible to direct anything well—city or household or anything else—if not temperately and justly?

MENO. Certainly not.

B SOCRATES. And that means with temperance and justice?

MENO. Of course.

SOCRATES. Then both man and woman need the same qualities, justice and temperance, if they are going to be good.

MENO. It looks like it.

SOCRATES. And what about your child and old man? Could they be good if they were incontinent and unjust?

MENO. Of course not.

SOCRATES. They must be temperate and just?

MENO. Yes.

SOCRATES. So everyone is good in the same way, since they become good by possessing the same qualities. C

MENO. So it seems.

SOCRATES. And if they did not share the same virtue, they would not be good in the same way.

MENO. No.

SOCRATES. Seeing then that they all have the same virtue, try to remember and tell me what Gorgias, and you who share his opinion, say it is.

MENO. It must be simply the capacity to govern men, if you are looking for one quality to cover all the instances. D

SOCRATES. Indeed I am. But does this virtue apply to a child or a slave? Should a slave be capable of governing his master, and if he does, is he still a slave?

MENO. I hardly think so.

SOCRATES. It certainly doesn't sound likely. And here is another point. You speak of 'capacity to govern.' Shall we not add 'justly but not otherwise'?

MENO. I think we should, for justice is virtue.

SOCRATES. Virtue, do you say, or *a* virtue? E

MENO. What do you mean?

SOCRATES. Something quite general. Take roundness, for instance. I should say that it is a shape, not simply that it is shape, my reason being that there are other shapes as well.

MENO. I see your point, and I agree that there are other virtues besides justice.

74 SOCRATES. Tell me what they are. Just as I could name other shapes if you told me to, in the same way mention some other virtues.

MENO. In my opinion then courage is a virtue and temperance and wisdom and dignity and many other things.

SOCRATES. This puts us back where we were. In a different way we have discovered a number of virtues when we were looking for one only. This single virtue, which permeates each of them, we cannot find.

B MENO. No, I cannot yet grasp it as you want, a single virtue covering them all, as I do in other instances.

SOCRATES. I'm not surprised, but I shall do my best to get us a bit further if I can. You understand, I expect, that the question applies to everything. If someone took the example I mentioned just now, and asked you: 'What is shape?' and you replied that roundness is shape, and he then asked you as I did, 'Do you mean it is shape or *a* shape?' you would reply of course that it is *a* shape.

MENO. Certainly.

C SOCRATES. Your reason being that there are other shapes as well.

MENO. Yes.

SOCRATES. And if he went on to ask you what they were, you would tell him.

MENO. Yes.

SOCRATES. And the same with color—if he asked you what it is, and on your replying 'White,' took you up with: 'Is white color or *a* color?' you would say that it is *a* color, because there are other colors as well.

MENO. I should.

SOCRATES. And if he asked you to, you would mention other colors which are just as much colors as white is. D

MENO. Yes.

SOCRATES. Suppose then he pursued the question as I did, and objected: 'We always arrive at a plurality, but that is not the kind of answer I want. Seeing that you call these many particulars by one and the same name, and say that every one of them is a shape, even though they are the contrary of each other, tell me what this is which embraces round as well as straight, and what you mean by shape when you say that straightness is a shape as much as roundness. You do say that?' E

MENO. Yes.

SOCRATES. 'And in saying it, do you mean that roundness is no more round than straight, and straightness no more straight than round?'

MENO. Of course not.

SOCRATES. 'Yet you do say that roundness is no more a shape than straightness, and the other way about.'

MENO. Quite true.

SOCRATES. 'Then what is this thing which is called "shape"? Try to tell me.' If when asked this question either about shape or color you said: 'But I don't understand what you want, or what you mean,' your questioner would perhaps be surprised and say: 'Don't you see that I am looking for what is the same in all of them?' Would you even so be unable to reply, if the question was: 'What is it that is common to roundness and straightness and the other things which you call shapes?' Do your best to answer, as practice for the question about virtue. 75

MENO. No, you do it, Socrates. B

SOCRATES. Do you want me to give in to you?

MENO. Yes.

SOCRATES. And will you in your turn give me an answer about virtue?

MENO. I will.

SOCRATES. In that case I must do my best. It's in a good cause.

MENO. Certainly.

SOCRATES. Well now, let's try to tell you what shape is. See if you accept this definition. Let us define it as the only thing which always accompanies color. Does that satisfy you, or do you want it in some other way? I should be content if your
C definition of virtue were on similar lines.

MENO. But that's a naive sort of definition, Socrates.

SOCRATES. How?

MENO. Shape, if I understand what you say, is what always accompanies color. Well and good—but if somebody says that he doesn't know what color is, but is no better off with it than he is with shape, what sort of answer have you given him, do you think?

SOCRATES. A true one; and if my questioner were one of the clever, disputatious and quarrelsome kind, I should say to
D him: 'You have heard my answer. If it is wrong, it is for you to take up the argument and refute it.' However, when friendly people, like you and me, want to converse with each other, one's reply must be milder and more conducive to discussion. By that I mean that it must not only be true, but must employ terms with which the questioner admits he is familiar. So I will try to answer you like that. Tell me therefore, whether you
E recognize the term 'end'; I mean limit or boundary—all these words I use in the same sense. Prodicus might perhaps quarrel with us, but I assume you speak of something being bounded or coming to an end. That is all I mean, nothing subtle.

MENO. I admit the notion, and believe I understand your meaning.

SOCRATES. And again, you recognize 'surface' and 'solid,' as they are used in geometry? 76

MENO. Yes.

SOCRATES. Then with these you should by this time understand my definition of shape. To cover all its instances, I say that shape is that in which a solid terminates, or more briefly, it is the limit of a solid.

MENO. And how do you define color?

SOCRATES. What a shameless fellow you are, Meno. You keep bothering an old man to answer, but refuse to exercise your memory and tell me what was Gorgias's definition of B virtue.

MENO. I will, Socrates, as soon as you tell me this.

SOCRATES. Anyone talking to you could tell blindfold that you are a handsome man and still have your admirers.

MENO. Why so?

SOCRATES. Because you are for ever laying down the law as spoilt boys do, who act the tyrant as long as their youth lasts. No doubt you have discovered that I can never resist good C looks. Well, I will give in and let you have your answer.

MENO. Do by all means.

SOCRATES. Would you like an answer *à la* Gorgias, such as you would most readily follow?

MENO. Of course I should.

SOCRATES. You and he believe in Empedocles's theory of effluences, do you not?

MENO. Whole-heartedly.

SOCRATES. And passages to which and through which the effluences make their way?

MENO. Yes.

SOCRATES. Some of the effluences fit into some of the passages, whereas others are too coarse or too fine. D

MENO. That is right.

SOCRATES. Now you recognize the term 'sight'?

MENO. Yes.

SOCRATES. From these notions, then, 'grasp what I would tell,' as Pindar says. Color is an effluence from shapes commensurate with sight and perceptible by it.

MENO. That seems to me an excellent answer.

SOCRATES. No doubt it is the sort you are used to. And you probably see that it provides a way to define sound and smell
E and many similar things.

MENO. So it does.

SOCRATES. Yes, it's a high-sounding answer, so you like it better than the one on shape.

MENO. I do.

SOCRATES. Nevertheless, son of Alexidemus, I am convinced that the other is better; and I believe you would agree with me if you had not, as you told me yesterday, to leave before the mysteries, but could stay and be initiated.*

77 MENO. I would stay, Socrates, if you gave me more answers like this.

SOCRATES. You may be sure I shan't be lacking in keenness to do so, both for your sake and mine; but I'm afraid I may not be able to do it often. However, now it is your turn to do as you promised, and try to tell me the general nature of virtue. Stop making many out of one, as the humorists say when somebody breaks a plate. Just leave virtue whole and sound
B and tell me what it is, as in the examples I have given you.

MENO. It seems to me then, Socrates, that virtue is, in the words of the poet, 'to rejoice in the fine and have power,' and

* Evidently the Athenians are about to celebrate the famous rites of the Eleusinian Mysteries, but Meno has to return to Thessaly before they fall due. Plato frequently plays upon the analogy between religious initiation, which bestowed a revelation of divine secrets, and the insight which comes from initiation into the truths of philosophy.

I define it as desiring fine things and being able to acquire them.

SOCRATES. When you speak of a man desiring fine things, do you mean it is good things he desires?

MENO. Certainly.

SOCRATES. Then do you think some men desire evil and others good? Doesn't everyone, in your opinion, desire good C
things?

MENO. No.

SOCRATES. And would you say that the others suppose evils to be good, or do they still desire them although they recognize them as evil?

MENO. Both, I should say.

SOCRATES. What? Do you really think that anyone who recognizes evils for what they are, nevertheless desires them?

MENO. Yes.

SOCRATES. Desires in what way? To possess them?

MENO. Of course.

SOCRATES. In the belief that evil things bring advantage to D
their possessor, or harm?

MENO. Some in the first belief, but some also in the second.

SOCRATES. And do you believe that those who suppose evil things bring advantage understand that they are evil?

MENO. No, that I can't really believe.

SOCRATES. Isn't it clear then that this class, who don't recognize evils for what they are, don't desire evil but what E
they think is good, though in fact it is evil; those who through ignorance mistake bad things for good obviously desire the good.

MENO. For them I suppose that is true.

SOCRATES. Now as for those whom you speak of as desiring evils in the belief that they do harm to their possessor, these presumably know that they will be injured by them?

MENO. They must.

78 SOCRATES. And don't they believe that whoever is injured is, in so far as he is injured, unhappy?

MENO. That too they must believe.

SOCRATES. And unfortunate?

MENO. Yes.

SOCRATES. Well, does anybody want to be unhappy and unfortunate?

MENO. I suppose not.

SOCRATES. Then if not, nobody desires what is evil; for what else is unhappiness but desiring evil things and getting them?

B MENO. It looks as if you are right, Socrates, and nobody desires what is evil.

SOCRATES. Now you have just said that virtue consists in a wish for good things plus the power to acquire them. In this definition the wish is common to everyone, and in that respect no one is better than his neighbor.

MENO. So it appears.

SOCRATES. So if one man is better than another, it must evidently be in respect of the power, and virtue, according to

C your account, is the power of acquiring good things.

MENO. Yes, my opinion is exactly as you now express it.

SOCRATES. Let us see whether you have hit the truth this time. You may well be right. The power of acquiring good things, you say, is virtue?

MENO. Yes.

SOCRATES. And by good do you mean such things as health and wealth?

MENO. I include the gaining both of gold and silver and of high and honorable office in the State.

SOCRATES. Are these the only classes of goods that you recognize?

MENO. Yes, I mean everything of that sort.

SOCRATES. Right. In the definition of Meno, hereditary guest-friend of the Great King, the acquisition of gold and silver is virtue. Do you add 'just and righteous' to the word 'acquisition,' or doesn't it make any difference to you? Do you call it virtue all the same even if they are unjustly acquired? D

MENO. Certainly not.

SOCRATES. Vice then?

MENO. Most certainly.

SOCRATES. So it seems that justice or temperance or piety, or some other part of virtue, must attach to the acquisition. Otherwise, although it is a means to good things, it will not be virtue. E

MENO. No, how could you have virtue without these?

SOCRATES. In fact lack of gold and silver, if it results from failure to acquire it—either for oneself or another—in circumstances which would have made its acquisition unjust, is itself virtue.

MENO. It would seem so.

SOCRATES. Then to have such goods is no more virtue than to lack them. Rather we may say that whatever is accompanied by justice is virtue, whatever is without qualities of that sort is vice. 79

MENO. I agree that your conclusion seems inescapable.

SOCRATES. But a few minutes ago we called each of these—justice, temperance, and the rest—a part of virtue?

MENO. Yes, we did.

SOCRATES. So it seems you are making a fool of me.

MENO. How so, Socrates?

SOCRATES. I have just asked you not to break virtue up into fragments, and given you models of the type of answer I wanted, but taking no notice of this you tell me that virtue consists in the acquisition of good things with justice; and justice, you agree, is a part of virtue. B

MENO. True.

SOCRATES. So it follows from your own statements that to act with a part of virtue is virtue, if you call justice and all the rest parts of virtue. The point I want to make is that whereas I asked you to give me an account of virtue as a whole, far from telling me what it is itself you say that every action is virtue
C which exhibits a part of virtue, as if you had already told me what the whole is, so that I should recognize it even if you chop it up into bits. It seems to me that we must put the same old question to you, my dear Meno—the question: 'What is virtue?'—if every act becomes virtue when combined with a part of virtue. That is, after all, what it means to say that every act performed with justice is virtue. Don't you agree that the same question needs to be put? Does anyone know what a part of virtue is, without knowing the whole?

MENO. I suppose not.

D SOCRATES. No, and if you remember, when I replied to you about shape just now, I believe we rejected the type of answer that employs terms which are still in question and not yet agreed upon.

MENO. We did, and rightly.

SOCRATES. Then please do the same. While the nature of virtue as a whole is still under question, don't suppose that you can explain it to anyone in terms of its parts, or by any similar
E type of explanation. Understand rather that the same question remains to be answered; you say this and that about virtue, but what *is* it? Does this seem nonsense to you?

MENO. No, to me it seems right enough.

SOCRATES. Then go back to the beginning and answer my question. What do you and your friend say that virtue is?

MENO. Socrates, even before I met you they told me that
80 in plain truth you are a perplexed man yourself and reduce others to perplexity. At this moment I feel you are exercising

magic and witchcraft upon me and positively laying me under your spell until I am just a mass of helplessness. If I may be flippant, I think that not only in outward appearance but in other respects as well you are exactly like the flat sting-ray that one meets in the sea. Whenever anyone comes into contact with it, it numbs him, and that is the sort of thing that you seem to be doing to me now. My mind and my lips are literally numb, B and I have nothing to reply to you. Yet I have spoken about virtue hundreds of times, held forth often on the subject in front of large audiences, and very well too, or so I thought. Now I can't even say what it is. In my opinion you are well advised not to leave Athens and live abroad. If you behaved like this as a foreigner in another country, you would most likely be arrested as a wizard.

SOCRATES. You're a real rascal, Meno. You nearly took me in.

MENO. Just what do you mean?

SOCRATES. I see why you used a simile about me. C

MENO. Why, do you think?

SOCRATES. To be compared to something in return. All good-looking people, I know perfectly well, enjoy a game of comparisons. They get the best of it, for naturally handsome folk provoke handsome similes. But I'm not going to oblige you. As for myself, if the sting-ray paralyzes others only through being paralyzed itself, then the comparison is just, but not otherwise. It isn't that, knowing the answers myself, I perplex other people. The truth is rather that I infect them also with the perplexity I feel myself. So with virtue now. I don't D know what it is. You may have known before you came into contact with me, but now you look as if you don't. Nevertheless I am ready to carry out, together with you, a joint investigation and inquiry into what it is.

MENO. But how will you look for something when you

don't in the least know what it is? How on earth are you going to set up something you don't know as the object of your search? To put it another way, even if you come right up against it, how will you know that what you have found is the thing you didn't know?

E SOCRATES. I know what you mean. Do you realize that what you are bringing up is the trick argument that a man cannot try to discover either what he knows or what he does not know? He would not seek what he knows, for since he knows it there is no need of the inquiry, nor what he does not know, for in that case he does not even know what he is to look for.

81 MENO. Well, do you think it a good argument?

SOCRATES. No.

MENO. Can you explain how it fails?

SOCRATES. I can. I have heard from men and women who understand the truths of religion—

[Here he presumably pauses to emphasize the solemn change of tone which the dialogue undergoes at this point.]

MENO. What did they say?

SOCRATES. Something true, I thought, and fine.

MENO. What was it, and who were they?

SOCRATES. Those who tell it are priests and priestesses of the sort who make it their business to be able to account for

B the functions which they perform. Pindar speaks of it too, and many another of the poets who are divinely inspired. What they say is this—see whether you think they are speaking the truth. They say that the soul of man is immortal: at one time it comes to an end—that which is called death—and at another is born again, but is never finally exterminated. On these grounds a man must live all his days as righteously as possible. For those from whom

Persephone receives requital for ancient doom,
In the ninth year she restores again

Their souls to the sun above.
From whom rise noble kings C
And the swift in strength and greatest in wisdom;
And for the rest of time
*They are called heroes and sanctified by men.**

Thus the soul, since it is immortal and has been born many times, and has seen all things both here and in the other world, has learned everything that is. So we need not be surprised if it can recall the knowledge of virtue or anything else which, as we see, it once possessed. All nature is akin, and the soul has D learned everything, so that when a man has recalled a single piece of knowledge—*learned* it, in ordinary language—there is no reason why he should not find out all the rest, if he keeps a stout heart and does not grow weary of the search; for seeking and learning are in fact nothing but recollection.

We ought not then to be led astray by the contentious argument you quoted. It would make us lazy, and is music in the ears of weaklings. The other doctrine produces energetic seekers after knowledge; and being convinced of its truth, I am E ready, with your help, to inquire into the nature of virtue.

MENO. I see, Socrates. But what do you mean when you say that we don't learn anything, but that what we call learning is recollection? Can you teach me that it is so?

SOCRATES. I have just said that you're a rascal, and now you ask me if I can teach you, when I say there is no such 82 thing as teaching, only recollection. Evidently you want to catch me contradicting myself straight away.

MENO. No, honestly, Socrates, I wasn't thinking of that. It was just habit. If you can in any way make clear to me that what you say is true, please do.

SOCRATES. It isn't an easy thing, but still I should like to do what I can since you ask me. I see you have a large number of

* The quotation is from Pindar.

B retainers here. Call one of them, anyone you like, and I will use him to demonstrate it to you.

MENO. Certainly. *(To a slave-boy.)* Come here.

SOCRATES. He is a Greek and speaks our language?

MENO. Indeed yes—born and bred in the house.

SOCRATES. Listen carefully then, and see whether it seems to you that he is learning from me or simply being reminded.

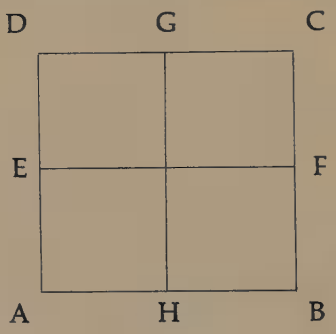
MENO. I will.

SOCRATES. Now boy, you know that a square is a figure like this?

(Socrates begins to draw figures in the sand at his feet. He points to the square ABCD.)

BOY. Yes.

C SOCRATES. It has all these four sides equal?



BOY. Yes.

SOCRATES. And these lines which go through the middle of it are also equal? *(The lines* EF, GH.)

BOY. Yes.

SOCRATES. Such a figure could be either larger or smaller, could it not?

BOY. Yes.

SOCRATES. Now if this side is two feet long, and this side

the same, how many feet will the whole be? Put it this way. If it were two feet in this direction and only one in that, must not the area be two feet taken once?

BOY. Yes.

SOCRATES. But since it is two feet this way also, does it not D
become twice two feet?

BOY. Yes.

SOCRATES. And how many feet is twice two? Work it out and tell me.

BOY. Four.

SOCRATES. Now could one draw another figure double the size of this, but similar, that is, with all its sides equal like this one?

BOY. Yes.

SOCRATES. How many feet will its area be?

BOY. Eight.

SOCRATES. Now then, try to tell me how long each of its sides will be. The present figure has a side of two feet. What E
will the side of the double-sized one?

BOY. It will be double, Socrates, obviously.

SOCRATES. You see, Meno, that I am not teaching him anything, only asking. Now he thinks he knows the length of the side of the eight-feet square.

MENO. Yes.

SOCRATES. But does he?

MENO. Certainly not.

SOCRATES. He thinks it is twice the length of the other.

MENO. Yes.

SOCRATES. Now watch how he recollects things in order—the proper way to recollect.

You say that the side of double length produces the double-sized figure? Like this I mean, not long this way and short 83
that. It must be equal on all sides like the first figure, only

twice its size, that is eight feet. Think a moment whether you still expect to get it from doubling the side.

BOY. Yes, I do.

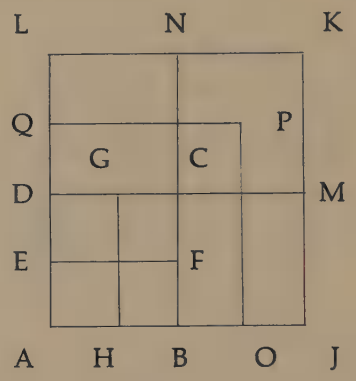
SOCRATES. Well now, shall we have a line double the length of this (AB) if we add another the same length at this end (BJ)?

BOY. Yes.

SOCRATES. It is on this line then, according to you, that we shall make the eight-feet square, by taking four of the same length?

BOY. Yes.

B SOCRATES. Let us draw in four equal lines (*i.e., counting* AJ, *and adding* JK, KL, *and* LA *made complete by drawing in its second half* LD), using the first as a base. Does this not give us what you call the eight-feet figure?



BOY. Certainly.

SOCRATES. But does it contain these four squares, each equal to the original four-feet one?

(*Socrates has drawn in the lines* CM, CN *to complete the squares that he wishes to point out.*)

BOY. Yes.

SOCRATES. How big is it then? Won't it be four times as big?

BOY. Of course.

SOCRATES. And is four times the same as twice?

BOY. Of course not.

SOCRATES. So doubling the side has given us not a double C
but a fourfold figure?

BOY. True.

SOCRATES. And four times four are sixteen, are they not?

BOY. Yes.

SOCRATES. Then how big is the side of the eight-feet figure? This one has given us four times the original area, hasn't it?

BOY. Yes.

SOCRATES. And a side half the length gave us a square of four feet?

BOY. Yes.

SOCRATES. Good. And isn't a square of eight feet double this one and half that?

BOY. Yes.

SOCRATES. Will it not have a side greater than this one but D
less than that?

BOY. I think it will.

SOCRATES. Right. Always answer what you think. Now tell me: was not this side two feet long, and this one four?

BOY. Yes.

SOCRATES. Then the side of the eight-feet figure must be longer than two feet but shorter than four?

BOY. It must.

SOCRATES. Try to say how long you think it is. E

BOY. Three feet.

SOCRATES. If so, shall we add half of this bit (BO, *half of* BJ) and make it three feet? Here are two, and this is one, and on this side similarly we have two plus one; and here is the figure you want.

(*Socrates completes the square* AOPQ.)

BOY. Yes.

SOCRATES. If it is three feet this way and three that, will the whole area be three times three feet?

BOY. It looks like it.

SOCRATES. And that is how many?

BOY. Nine.

SOCRATES. Whereas the square double our first square had to be how many?

BOY. Eight.

SOCRATES. But we haven't yet got the square of eight feet even from a three-feet side?

BOY. No.

SOCRATES. Then what length will give it? Try to tell us
84 exactly. If you don't want to count it up, just show us on the diagram.

BOY. It's no use, Socrates, I just don't know.

SOCRATES. Observe, Meno, the stage he has reached on the path of recollection. At the beginning he did not know the side of the square of eight feet. Nor indeed does he know it now, but then he thought he knew it and answered boldly, as was appropriate—he felt no perplexity. Now however he does feel per-
B plexed. Not only does he not know the answer; he doesn't even think he knows.

MENO. Quite true.

SOCRATES. Isn't he in a better position now in relation to what he didn't know?

MENO. I admit that too.

SOCRATES. So in perplexing him and numbing him like the sting-ray, have we done him any harm?

MENO. I think not.

SOCRATES. In fact we have helped him to some extent toward finding out the right answer, for now not only is he ignorant of it but he will be quite glad to look for it. Up to now,
C he thought he could speak well and fluently, on many occasions and before large audiences, on the subject of a square double

the size of a given square, maintaining that it must have a side of double the length.

MENO. No doubt.

SOCRATES. Do you suppose then that he would have attempted to look for, or learn, what he thought he knew (though he did not), before he was thrown into perplexity, became aware of his ignorance, and felt a desire to know?

MENO. No.

SOCRATES. Then the numbing process was good for him?

MENO. I agree.

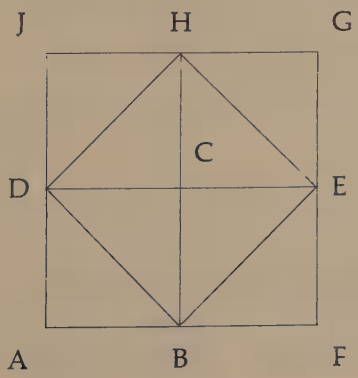
SOCRATES. Now notice what, starting from this state of perplexity, he will discover by seeking the truth in company with me, though I simply ask him questions without teaching him. Be ready to catch me if I give him any instruction or ex- D
planation instead of simply interrogating him on his own opinions.

(*Socrates here rubs out the previous figures and starts again.*)

Tell me, boy, is not this our square of four feet? (ABCD.) You understand?

BOY. Yes.

SOCRATES. Now we can add another equal to it like this? (BFEC.)



BOY. Yes.

SOCRATES. And a third here, equal to each of the others? (CEGH.)

BOY. Yes.

SOCRATES. And then we can fill in this one in the corner? (DCHJ.)

BOY. Yes.

SOCRATES. Then here we have four equal squares?

E BOY. Yes.

SOCRATES. And how many times the size of the first square is the whole?

BOY. Four times.

SOCRATES. And we want one double the size. You remember?

BOY. Yes.

SOCRATES. Now does this line going from corner to corner

85 cut each of these squares in half?

BOY. Yes.

SOCRATES. And these are four equal lines enclosing this area? (BEHD.)

BOY. They are.

SOCRATES. Now think. How big is this area?

BOY. I don't understand.

SOCRATES. Here are four squares. Has not each line cut off the inner half of each of them?

BOY. Yes.

SOCRATES. And how many such halves are there in this figure? (BEHD.)

BOY. Four.

SOCRATES. And how many in this one? (ABCD.)

BOY. Two.

SOCRATES. And what is the relation of four to two?

BOY. Double.

SOCRATES. How big is this figure then?

BOY. Eight feet. B

SOCRATES. On what base?

BOY. This one.

SOCRATES. The line which goes from corner to corner of the square of four feet?

BOY. Yes.

SOCRATES. The technical name for it is 'diagonal'; so if we use that name, it is your personal opinion that the square on the diagonal of the original square is double its area.

BOY. That is so, Socrates.

SOCRATES. What do you think, Meno? Has he answered with any opinions that were not his own?

MENO. No, they were all his. C

SOCRATES. Yet he did not know, as we agreed a few minutes ago.

MENO. True.

SOCRATES. But these opinions were somewhere in him, were they not?

MENO. Yes.

SOCRATES. So a man who does not know has in himself true opinions on a subject without having knowledge.

MENO. It would appear so.

SOCRATES. At present these opinions, being newly aroused, have a dream-like quality. But if the same questions are put to him on many occasions and in different ways, you can see that in the end he will have a knowledge on the subject as accurate as anybody's. D

MENO. Probably.

SOCRATES. This knowledge will not come from teaching but from questioning. He will recover it for himself.

MENO. Yes.

SOCRATES. And the spontaneous recovery of knowledge that is in him is recollection, isn't it?

MENO. Yes.

SOCRATES. Either then he has at some time acquired the knowledge which he now has, or he has always possessed it. If he always possessed it, he must always have known; if on the other hand he acquired it at some previous time, it cannot
E have been in this life, unless somebody has taught him geometry. He will behave in the same way with all geometrical knowledge, and every other subject. Has anyone taught him all these? You ought to know, especially as he has been brought up in your household.

MENO. Yes, I know that no one ever taught him.

SOCRATES. And has he these opinions, or hasn't he?

MENO. It seems we can't deny it.

SOCRATES. Then if he did not acquire them in this life, isn't
86 it immediately clear that he possessed and had learned them during some other period?

MENO. It seems so.

SOCRATES. When he was not in human shape?

MENO. Yes.

SOCRATES. If then there are going to exist in him, both while he is and while he is not a man, true opinions which can be aroused by questioning and turned into knowledge, may we say that his soul has been for ever in a state of knowledge? Clearly he always either is or is not a man.

MENO. Clearly.

B SOCRATES. And if the truth about reality is always in our soul, the soul must be immortal, and one must take courage and try to discover—that is, to recollect—what one doesn't happen to know, or (more correctly) remember, at the moment.

MENO. Somehow or other I believe you are right.

SOCRATES. I think I am. I shouldn't like to take my oath on the whole story, but one thing I am ready to fight for as long as I can, in word and act: that is, that we shall be better, braver

and more active men if we believe it right to look for what we don't know than if we believe there is no point in looking because what we don't know we can never discover. C

MENO. There too I am sure you are right.

SOCRATES. Then since we are agreed that it is right to inquire into something that one does not know, are you ready to face with me the question: what is virtue?

MENO. Quite ready. All the same, I would rather consider the question as I put it at the beginning, and hear your views on it; that is, are we to pursue virtue as something that can be taught, or do men have it as a gift of nature or how? D

SOCRATES. If I were your master as well as my own, Meno, we should not have inquired whether or not virtue can be taught until we had first asked the main question—what it is; but not only do you make no attempt to govern your own actions—you prize your freedom, I suppose—but you attempt to govern mine. And you succeed too, so I shall let you have your way. There's nothing else for it, and it seems we must inquire into a single property of something about whose essential nature we are still in the dark. Just grant me one small relaxation of your sway, and allow me, in considering whether or not it can be taught, to make use of a hypothesis—the sort of thing, I mean, that geometers often use in their inquiries. When they are asked, for example, about a given area, whether it is possible for this area to be inscribed as a triangle in a given circle, they will probably reply: 'I don't know yet whether it 87
fulfils the conditions, but I think I have a hypothesis which will help us in the matter. It is this. If the area is such that, when one has applied it [*sc. as a rectangle*] to the given line [*i.e., the diameter*] of the circle, it is deficient by another rectangle similar to the one which is applied, then, I should say, one result follows; if not, the result is different. If you ask me, then, about the inscription of the figure in the circle—whether it is possible B

or not—I am ready to answer you in this hypothetical way.'*

Let us do the same about virtue. Since we don't know what it is or what it resembles, let us use a hypothesis in investigating whether it is teachable or not. We shall say: 'What attribute of the soul must virtue be, if it is to be teachable or otherwise?' Well, in the first place, if it is anything else but knowledge, is there a possibility of anyone teaching it—or, in the language we used just now, reminding someone of it? We needn't worry about which name we are to give to the process, but simply ask:
C will it be teachable? Isn't it plain to everyone that a man is not taught anything except knowledge?

MENO. That would be my view.

SOCRATES. If on the other hand virtue is some sort of knowledge, clearly it could be taught.

MENO. Certainly.

SOCRATES. So that question is easily settled; I mean, on what condition virtue would be teachable.

MENO. Yes.

SOCRATES. The next point then, I suppose, is to find out whether virtue is knowledge or something different.

D MENO. That is the next question, I agree.

SOCRATES. Well then, do we assert that virtue is something good? Is that assumption a firm one for us?

MENO. Undoubtedly.

SOCRATES. That being so, if there exists any good thing different from, and not associated with, knowledge, virtue will not

* The geometrical illustration here adduced by Socrates is very loosely and obscurely expressed. Sir Thomas Heath in his *History of Greek Mathematics* (1921, vol. I, p. 298) says that C. Blass, writing in 1861, already knew of thirty different interpretations, and that many more had appeared since then. Fortunately it is not necessary to understand the example in order to grasp the hypothetical method which Socrates is expounding.

necessarily be any form of knowledge. If on the other hand knowledge embraces everything that is good, we shall be right to suspect that virtue is knowledge.

MENO. Agreed.

SOCRATES. First then, is it virtue which makes us good?

MENO. Yes.

SOCRATES. And if good, then advantageous. All good things E
are advantageous, are they not?

MENO. Yes.

SOCRATES. So virtue itself must be something advantageous?

MENO. That follows also.

SOCRATES. Now suppose we consider what are the sort of things that profit us. Take them in a list. Health, we may say, and strength and good looks, and wealth—these and their like we call advantageous, you agree?

MENO. Yes.

SOCRATES. Yet we also speak of these things as sometimes 88
doing harm. Would you object to that statement?

MENO. No, it is so.

SOCRATES. Now look here: what is the controlling factor which determines whether each of these is advantageous or harmful? Isn't it right use which makes them advantageous, and lack of it, harmful?

MENO. Certainly.

SOCRATES. We must also take spiritual qualities into consideration. You recognize such things as temperance, justice, courage, quickness of mind, memory, nobility of character and others?

MENO. Yes of course I do. B

SOCRATES. Then take any such qualities which in your view are not knowledge but something different. Don't you think they may be harmful as well as advantageous? Courage

for instance, if it is something thoughtless, just a sort of confidence. Isn't it true that to be confident without reason does a man harm, whereas a reasoned confidence profits him?

MENO. Yes.

SOCRATES. Temperance and quickness of mind are no different. Learning and discipline are profitable in conjunction with wisdom, but without it harmful.

C MENO. That is emphatically true.

SOCRATES. In short, everything that the human spirit undertakes or suffers will lead to happiness when it is guided by wisdom, but to the opposite, when guided by folly.

MENO. A reasonable conclusion.

SOCRATES. If then virtue is an attribute of the spirit, and one which cannot fail to be beneficial, it must be wisdom; for all spiritual qualities in and by themselves are neither advan-
D tageous nor harmful, but become advantageous or harmful by the presence with them of wisdom or folly. If we accept this argument, then virtue, to be something advantageous, must be a sort of wisdom.

MENO. I agree.

SOCRATES. To go back to the other class of things, wealth and the like, of which we said just now that they are sometimes good and sometimes harmful, isn't it the same with them? Just as wisdom when it governs our other psychological impulses turns them to advantage, and folly turns them to harm, so the
E mind by its right use and control of these material assets makes them profitable, and by wrong use renders them harmful.

MENO. Certainly.

SOCRATES. And the right user is the mind of the wise man, the wrong user the mind of the foolish.

MENO. That is so.

SOCRATES. So we may say in general that the goodness of

non-spiritual assets depends on our spiritual character, and the goodness of that on wisdom. This argument shows that the 89
advantageous element must be wisdom; and virtue, we agree, is advantageous, so that amounts to saying that virtue, either in whole or in part, is wisdom.

MENO. The argument seems to me fair enough.

SOCRATES. If so, good men cannot be good by nature.

MENO. I suppose not.

SOCRATES. There is another point. If they were, there would B
probably be experts among us who could recognize the naturally good at an early stage. They would point them out to us and we should take them and shut them away safely in the Acropolis, sealing them up more carefully than bullion to protect them from corruption and ensure that when they came to maturity they would be of use to the State.

MENO. It would be likely enough.

SOCRATES. Since then goodness does not come by nature, is it got by learning? C

MENO. I don't see how we can escape the conclusion. Indeed it is obvious on our assumption that, if virtue is knowledge, it is teachable.

SOCRATES. I suppose so. But I wonder if we were right to bind ourselves to that.

MENO. Well, it seemed all right just now.

SOCRATES. Yes, but to be sound it has got to seem all right not only 'just now' but at this moment and in the future.

MENO. Of course. But what has occurred to you to make D
you turn against it and suspect that virtue may not be knowledge?

SOCRATES. I'll tell you. I don't withdraw from the position that if it is knowledge, it must be teachable; but as for its being knowledge, see whether you think my doubts on this point are

well founded. If anything—not virtue only—is a possible subject of instruction, must there not be teachers and students of it?

MENO. Surely.

E SOCRATES. And what of the converse, that if there are neither teachers nor students of a subject, we may safely infer that it cannot be taught?

MENO. That is true. But don't you think there are teachers of virtue?

SOCRATES. All I can say is that I have often looked to see if there are any, and in spite of all my efforts I cannot find them, though I have had plenty of fellow-searchers, the kind of men especially whom I believe to have most experience in such matters. But look, Meno, here's a piece of luck. Anytus has just sat down beside us. We couldn't do better than make him a
90 partner in our inquiry. In the first place he is the son of Anthemion, a man of property and good sense, who didn't get his money out of the blue or as a gift—like Ismenias of Thebes who has just come into the fortune of a Croesus—but earned it by his own brains and hard work. Besides this he shows himself a decent, modest citizen with no arrogance or bombast or offen-
B siveness about him. Also he brought up his son well and had him properly educated, as the Athenian people appreciate: look how they elect him into the highest offices in the State. This is certainly the right sort of man with whom to inquire whether there are any teachers of virtue, and if so who they are.

Please help us, Anytus—Meno, who is a friend of your family, and myself—to find out who may be the teachers of this subject. Look at it like this. If we wanted Meno to become a
C good doctor, shouldn't we send him to the doctors to be taught?

ANYTUS. Of course.

SOCRATES. And if we wanted him to become a shoemaker, to the shoemakers?

ANYTUS. Yes.

SOCRATES. And so on with other trades?

ANYTUS. Yes.

SOCRATES. Now another relevant question. When we say that to make Meno a doctor we should be right in sending him to the doctors, have we in mind that the sensible thing is to D
send him to those who profess the subject rather than to those who don't, men who charge a fee as professionals, having announced that they are prepared to teach whoever likes to come and learn?

ANYTUS. Yes.

SOCRATES. The same is surely true of flute-playing and other accomplishments. If you want to make someone a per- E
former on the flute it would be very foolish to refuse to send him to those who undertake to teach the art and are paid for it, but to go and bother other people instead and have him try to learn from them—people who don't set up to be teachers or take any pupils in the subject which we want our young man to learn. Doesn't that sound very unreasonable?

ANYTUS. Sheer stupidity I should say.

SOCRATES. I agree. And now we can both consult together 91
about our visitor Meno. He has been telling me all this while that he longs to acquire the kind of wisdom and virtue which fits men to manage an estate or govern a city, to look after their parents, and to entertain and send off guests in proper style, both their own countrymen and foreigners. With this in mind, to whom would it be right to send him? What we have just said B
seems to show that the right people are those who profess to be teachers of virtue and offer their services freely to any Greek who wishes to learn, charging a fixed fee for their instruction.

ANYTUS. Whom do you mean by that, Socrates?

SOCRATES. Surely you know yourself that they are the men called Sophists.

ANYTUS. Good heavens, what a thing to say! I hope no rela- C

tive of mine or any of my friends, Athenian or foreign, would be so mad as to go and let himself be ruined by those people. That's what they are, the manifest ruin and corruption of anyone who comes into contact with them.

SOCRATES. What, Anytus? Can they be so different from other claimants to useful knowledge that they not only don't do good, like the rest, to the material that one puts in their
D charge, but on the contrary spoil it—and have the effrontery to take money for doing so? I for one find it difficult to believe you. I know that one of them alone, Protagoras, earned more money from being a Sophist than an outstandingly fine craftsman like Phidias and ten other sculptors put together. A man who mends old shoes or restores coats couldn't get away with it
E for a month if he gave them back in worse condition than he received them; he would soon find himself starving. Surely it is incredible that Protagoras took in the whole of Greece, corrupting his pupils and sending them away worse than when they came to him, for more than forty years. I believe he was nearly seventy when he died, and had been practicing for forty years, and all that time—indeed to this very day—his reputation has been consistently high; and there are plenty of others
92 besides Protagoras, some before his time and others still alive. Are we to suppose from your remark that they consciously deceive and ruin young men, or are they unaware of it themselves? Can these remarkably clever men—as some regard them—be mad enough for that?

ANYTUS. Far from it, Socrates. It isn't they who are mad, but rather the young men who hand over their money, and those responsible for them, who let them get into the Sophists'
B hands, are even worse. Worst of all are the cities who allow them in, or don't expel them, whether it be a foreigner or one of themselves who tries that sort of game.

SOCRATES. Has one of the Sophists done you a personal injury, or why are you so hard on them?

ANYTUS. Heavens, no! I've never in my life had anything to do with a single one of them, nor would I hear of any of my family doing so.

SOCRATES. So you've had no experience of them at all?

ANYTUS. And don't want any either.

SOCRATES. You surprise me. How can you know what is C
good or bad in something when you have no experience of it?

ANYTUS. Quite easily. At any rate I know *their* kind, whether I've had experience or not.

SOCRATES. It must be second sight, I suppose; for how else you know about them, judging from what you tell me yourself, I can't imagine. However, we are not asking whose instruction it is that would ruin Meno's character. Let us say that those are D
the Sophists if you like, and tell us instead about the ones we want. You can do a good turn to a friend of your father's house if you will let him know to whom in our great city he should apply for proficiency in the kind of virtue I have just described.

ANYTUS. Why not tell him yourself?

SOCRATES. Well, I did mention the men who in my opinion teach these things, but apparently I was talking nonsense. So you say, and you may well be right. Now it is your turn to E
direct him; mention the name of any Athenian you like.

ANYTUS. But why mention a particular individual? Any decent Athenian gentleman whom he happens to meet, if he follows his advice, will make him a better man than the Sophists would.

SOCRATES. And did these gentlemen get their fine qualities spontaneously—self-taught, as it were, and yet able to teach this untaught virtue to others? 93

ANYTUS. I suppose they in their turn learned it from forebears who were gentlemen like themselves. Would you deny that there have been many good men in our city?

SOCRATES. On the contrary, there are plenty of good statesmen here in Athens and have been as good in the past. The

question is, have they also been good teachers of their own virtue? That is the point we are discussing now—not whether or not there are good men in Athens or whether there have been
B in past times, but whether virtue can be taught. It amounts to the question whether the good men of this and former times have known how to hand on to someone else the goodness that was in themselves, or whether on the contrary it is not something that can be handed over, or that one man can receive from another. That is what Meno and I have long been puzzling over. Look at it from your own point of view. You would say that
C Themistocles was a good man?

ANYTUS. Yes, none better.

SOCRATES. And that he, if anyone, must have been a good teacher of his own virtue?

ANYTUS. I suppose so, if he wanted to be.

SOCRATES. But don't you think he must have wanted others to become worthy men—above all, surely, his own son? Do you suppose he grudged him this and purposely didn't pass on his
D own virtue to him? You must have heard that he had his son Cleophantus so well trained in horsemanship that he could stand upright on horseback and throw a javelin from that position; and many other wonderful accomplishments the young man had, for his father had him taught and made expert in every skill that a good instructor could impart. You must have heard this from older people?

ANYTUS. Yes.

SOCRATES. No one, then, could say that there was anything wrong with the boy's natural powers?

E ANYTUS. Perhaps not.

SOCRATES. But have you ever heard anyone, young or old, say that Cleophantus the son of Themistocles was a good and wise man in the way that his father was?

ANYTUS. Certainly not.

SOCRATES. Must we conclude then that Themistocles's aim was to educate his son in other accomplishments, but not to make him any better than his neighbors in his own type of wisdom—that is, supposing that virtue could be taught?

ANYTUS. I hardly think we can.

SOCRATES. So much then for Themistocles as a teacher of virtue, whom you yourself agree to have been one of the best men of former times. Take another example, Aristides son of 94
Lysimachus. You accept him as a good man?

ANYTUS. Surely.

SOCRATES. He too gave his son Lysimachus the best education in Athens, in all subjects where a teacher could help; but did he make him a better man than his neighbor? You know him, I think, and can say what he is like. Or again there is Pericles, that great and wise man. He brought up two sons, B
Paralus and Xanthippus, and had them taught riding, music, athletics, and all the other skilled pursuits till they were as good as any in Athens. Did he then not want to make them good men? Yes, he wanted that, no doubt, but I am afraid it is something that cannot be done by teaching. And in case you should think that only very few, and those the most insignificant, lacked this power, consider that Thucydides also had two sons, C
Melesias and Stephanus, to whom he gave an excellent education. Among other things they were the best wrestlers in Athens, for he gave one to Xanthias to train and the other to Eudoxus—the two who, I understand, were considered the finest wrestlers of their time. You remember?

ANYTUS. I have heard of them.

SOCRATES. Surely then he would never have had his children taught these expensive pursuits and yet refused to teach D
them to be good men—which would have cost nothing at all—if virtue could have been taught? You are not going to tell me that Thucydides was a man of no account, or that he had not

plenty of friends both at Athens and among the allies? He came of an influential family and was a great power both here and in the rest of Greece. If virtue could have been taught, he would have found the man to make his sons good, either among our
E own citizens or abroad, supposing his political duties left him no time to do it himself. No, my dear Anytus, it looks as if it cannot be taught.

ANYTUS. You seem to me, Socrates, to be too ready to run people down. My advice to you, if you will listen to it, is to be careful. I dare say that in all cities it is easier to do a man harm
95 than good, and it is certainly so here, as I expect you know yourself.

SOCRATES. Anytus seems angry, Meno, and I am not surprised. He thinks I am slandering our statesmen, and moreover he believes himself to be one of them. He doesn't know what slander really is: if he ever finds out he will forgive me.

However, tell me this yourself: are there not similar fine characters in your country?

MENO. Yes, certainly.

B SOCRATES. Do they come forward of their own accord to teach the young? Do they agree that they are teachers and that virtue can be taught?

MENO. No indeed, they don't agree on it at all. Sometimes you will hear them say that it can be taught, sometimes that it cannot.

SOCRATES. Ought we then to class as teachers of it men who are not even agreed that it can be taught?

MENO. Hardly, I think.

SOCRATES. And what about the Sophists, the only people who profess to teach it? Do you think they do?

C MENO. The thing I particularly admire about Gorgias, Socrates, is that you will never hear him make this claim; indeed he laughs at the others when he hears them do so. In his view his job is to make clever speakers.

SOCRATES. So you too don't think the Sophists are teachers?

MENO. I really can't say. Like most people I waver—sometimes I think they are and sometimes I think they are not.

SOCRATES. Has it ever occurred to you that you and our statesmen are not alone in this? The poet Theognis likewise D
says in one place that virtue is teachable and in another that it is not.

MENO. Really? Where?

SOCRATES. In the elegiacs in which he writes:

> *Eat, drink, and sit with men of power and weight,*
> *Nor scorn to gain the favor of the great.*
> *For fine men's teaching to fine ways will win thee:*
> *Low company destroys what wit is in thee.* E

There he speaks as if virtue can be taught, doesn't he?

MENO. Clearly.

SOCRATES. But elsewhere he changes his ground a little:

> *Were mind by art created and instilled*
> *Immense rewards had soon the pockets filled*

of the people who could do this. Moreover

> *No good man's son would ever worthless be,*
> *Taught by wise counsel. But no teacher's skill* 96
> *Can turn to good what is created ill.*

Do you see how he contradicts himself?

MENO. Plainly.

SOCRATES. Can you name any other subject, in which the professed teachers are not only not recognized as teachers of others, but are thought to have no understanding of it themselves, and to be no good at the very subject they profess to B
teach; whereas those who are acknowledged to be the best at it are in two minds whether it can be taught or not? When people are so confused about a subject, can you say that they are in a true sense teachers?

MENO. Certainly not.

SOCRATES. Well, if neither the Sophists nor those who display fine qualities themselves are teachers of virtue, I am sure
C no one else can be, and if there are no teachers, there can be no students either.

MENO. I quite agree.

SOCRATES. And we have also agreed that a subject of which there were neither teachers nor students was not one which could be taught.

MENO. That is so.

SOCRATES. Now there turn out to be neither teachers nor students of virtue, so it would appear that virtue cannot be taught.

D MENO. So it seems, if we have made no mistake; and it makes me wonder, Socrates, whether there are in fact no good men at all, or how they are produced when they do appear.

SOCRATES. I have a suspicion, Meno, that you and I are not much good. Our masters Gorgias and Prodicus have not trained us properly. We must certainly take ourselves in hand, and try
E to find someone who will improve us by hook or by crook. I say this with our recent discussion in mind, for absurdly enough we failed to perceive that it is not only under the guidance of knowledge that human action is well and rightly conducted. I believe that may be what prevents us from seeing how it is that men are made good.

MENO. What do you mean?

SOCRATES. This. We were correct, were we not, in agreeing
97 that good men must be profitable or useful? It cannot be otherwise, can it?

MENO. No.

SOCRATES. And again that they will be of some use if they conduct our affairs aright—that also was correct?

MENO. Yes.

SOCRATES. But in insisting that knowledge was a *sine qua non* for right leadership, we look like being mistaken.

MENO. How so?

SOCRATES. Let me explain. If someone knows the way to Larissa, or anywhere else you like, then when he goes there and takes others with him he will be a good and capable guide, you would agree?

MENO. Of course.

SOCRATES. But if a man judges correctly which is the road, B
though he has never been there and doesn't know it, will he not also guide others aright?

MENO. Yes, he will.

SOCRATES. And as long as he has a correct opinion on the points about which the other has knowledge, he will be just as good a guide, believing the truth but not knowing it.

MENO. Just as good.

SOCRATES. Therefore true opinion is as good a guide as knowledge for the purpose of acting rightly. That is what we left out just now in our discussion of the nature of virtue, when we said that knowledge is the only guide to right action. There C
was also, it seems, true opinion.

MENO. It seems so.

SOCRATES. So right opinion is something no less useful than knowledge.

MENO. Except that the man with knowledge will always be successful, and the man with right opinion only sometimes.

SOCRATES. What? Will he not always be successful so long as he has the right opinion?

MENO. That must be so, I suppose. In that case, I wonder why knowledge should be so much more prized than right D
opinion, and indeed how there is any difference between them.

SOCRATES. Shall I tell you the reason for your surprise, or do you know it?

MENO. No, tell me.

SOCRATES. It is because you have not observed the statues of Daedalus. Perhaps you don't have them in your country.

MENO. What makes you say that?

SOCRATES. They too, if no one ties them down, run away and escape. If tied, they stay where they are put.

E MENO. What of it?

SOCRATES. If you have one of his works untethered, it is not worth much: it gives you the slip like a runaway slave. But a tethered specimen is very valuable, for they are magnificent creations. And that, I may say, has a bearing on the matter of true opinions. True opinions are a fine thing and do all sorts of
98 good so long as they stay in their place; but they will not stay long. They run away from a man's mind, so they are not worth much until you tether them by working out the reason. That process, my dear Meno, is recollection, as we agreed earlier. Once they are tied down, they become knowledge, and are stable. That is why knowledge is something more valuable than right opinion. What distinguishes one from the other is the tether.

MENO. It does seem something like that, certainly.

B SOCRATES. Well of course, I have only been using an analogy myself, not knowledge. But it is not, I am sure, a mere guess to say that right opinion and knowledge are different. There are few things that I should claim to know, but that at least is among them, whatever else is.

MENO. You are quite right.

SOCRATES. And is this right too, that true opinion when it governs any course of action produces as good a result as knowledge?

MENO. Yes, that too is right, I think.

C SOCRATES. So that for practical purposes right opinion is

no less useful than knowledge, and the man who has it is no less useful than the one who knows.

MENO. That is so.

SOCRATES. Now we have agreed that the good man is useful.

MENO. Yes.

SOCRATES. To recapitulate then: assuming that there are men good and useful to the community, it is not only knowledge that makes them so, but also right opinion, and neither of these comes by nature but both are acquired—or do you think D
either of them *is* natural?

MENO. No.

SOCRATES. So if both are acquired, good men themselves are not good by nature.

MENO. No.

SOCRATES. That being so, the next thing we inquired was whether their goodness was a matter of teaching, and we decided that it would be, if virtue were knowledge, and conversely, that if it could be taught, it would be knowledge.

MENO. Yes.

SOCRATES. Next, that if there were teachers of it, it could be E
taught, but not if there were none.

MENO. That was so.

SOCRATES. But we have agreed that there are no teachers of it, and so that it cannot be taught and is not knowledge.

MENO. We did.

SOCRATES. At the same time we agreed that it is something good, and that to be useful and good consists in giving right guidance.

MENO. Yes.

SOCRATES. And that these two, true opinion and knowledge, 99
are the only things which direct us aright and the possession of which makes a man a true guide. We may except chance,

because what turns out right by chance is not due to human direction, and say that where human control leads to right ends, these two principles are directive, true opinion and knowledge.

MENO. Yes, I agree.

SOCRATES. Now since virtue cannot be taught, we can no
B longer believe it to be knowledge, so that one of our two good and useful principles is excluded, and knowledge is not the guide in public life.

MENO. No.

SOCRATES. It is not then by the possession of any wisdom that such men as Themistocles, and the others whom Anytus mentioned just now, became leaders in their cities. This fact, that they do not owe their eminence to knowledge, will explain why they are unable to make others like themselves.

MENO. No doubt it is as you say.

SOCRATES. That leaves us with the other alternative, that it is well-aimed conjecture which statesmen employ in upholding
C their countries' welfare. Their position in relation to knowledge is no different from that of prophets and tellers of oracles, who under divine inspiration utter many truths, but have no knowledge of what they are saying.

MENO. It must be something like that.

SOCRATES. And ought we not to reckon those men divine who with no conscious thought are repeatedly and outstandingly successful in what they do or say?

MENO. Certainly.

SOCRATES. We are right therefore to give this title to the
D oracular priests and the prophets that I mentioned, and to poets of every description. Statesmen too, when by their speeches they get great things done yet know nothing of what they are saying, are to be considered as acting no less under divine influence, inspired and possessed by the divinity.

MENO. Certainly.

SOCRATES. Women, you know, Meno, do call good men 'divine,' and the Spartans too, when they are singing a good man's praises, say 'He is divine.'

MENO. And it looks as if they are right—though our friend Anytus may be annoyed with you for saying so. E

SOCRATES. I can't help that. We will talk to him some other time. If all we have said in this discussion, and the questions we have asked, have been right, virtue will be acquired neither by nature nor by teaching. Whoever has it gets it by divine dispensation without taking thought, unless he be the kind of 100
statesman who can create another like himself. Should there be such a man, he would be among the living practically what Homer said Tiresias was among the dead, when he described him as the only one in the underworld who kept his wits—'the others are mere flitting shades.' Where virtue is concerned such a man would be just like that, a solid reality among shadows.

MENO. That is finely put, Socrates. B

SOCRATES. On our present reasoning then, whoever has virtue gets it by divine dispensation. But we shall not understand the truth of the matter until, before asking how men get virtue, we try to discover what virtue is in and by itself. Now it is time for me to go; and my request to you is that you will allay the anger of your friend Anytus by convincing him that what you now believe is true. If you succeed, the Athenians may C
have cause to thank you.

Essays

St. Augustine / From

On the teacher

VIII

. . .

AUGUSTINE. Now then, let us take up that part of the discussion in which signs designate not other signs but what we call "signifiables"—things that can be signified. First, tell me this: is a person a person[1]?

The selection from ON THE TEACHER *includes Chapter* VIII *through the end. This translation is by Joel Lidov of the Department of Classics, University of California, Berkeley, and appears here for the first time.*

[1] Latin *homo*, literally "man, human being." "Person" is a weaker word but the following discussion requires a two-syllable noun. The reader should also be aware that in Latin there is nothing to correspond to our indefinite and definite articles *a* and *the*.

ADEODATUS. I really don't know if you're joking.

AUG. Why do you say that?

AD. Because you think you should ask me if a person is anything other than a person.

AUG. I suppose you would likewise think you were being made fun of if I were to ask whether the first syllable of that noun is anything other than *per*, and the second other than *son*.

AD. That is surely the case.

AUG. But these two syllables joined make a *person*—or do you deny that?

AD. Who would deny it?

AUG. I am asking you, then, whether you are these two joined-up syllables.

AD. Certainly not; but I do see what you are aiming at.

AUG. Let it be said, then, so you won't think I am insulting you.

AD. You figure the conclusion to be that I am not a "person."

AUG. And don't you, too, since you have granted that everything which led up to this conclusion is true?

AD. I will not tell you what I think until you tell me whether, when you ask, "Is a person a person?" you are asking me about those two syllables or about the actual thing that they signify.

AUG. I'd rather have you answer in whichever way you take my question. For if it is ambiguous, you should have been on guard before and should not have answered me until you were sure how the question was meant.

AD. But how could this ambiguity hinder me, since my answer fits the question both ways: a "person" is in every respect a "person." For those two syllables are nothing else than those two syllables, and what they signify is nothing else than what it is.

AUG. Point well taken. But why do you only take this

spoken "person" both ways and not also the other things that we said?

AD. How is it proved that I did not take the others this way too?

AUG. Other reasons aside, on the grounds that if you had taken the whole of my first question in the sense that syllables are sounds, you would not have answered me, since I would not even have seemed to you to have asked anything. As it is when I sounded three words, repeating one of them at the end, and said, "Is a person a person?" you took the first and second words as signs, but the third as that which is signified by these two. And indeed, this fact alone makes it clear that, at once, sure and confident, you assumed that the question had to be answered.

AD. That is the truth.

AUG. What, then, disposed you to take only that which was positioned last and sounded third according to both its sound and its signification?

AD. But look, now I will take the whole question only in the sense that it signifies something. For I agree with you that conversation is altogether impossible unless the mind, at the sound of words, is turned to what those words are signs of. So show me now how I was misled in that line of reasoning which concluded that I am not a person.

AUG. Instead, I will ask the same questions again, so you might find for yourself where you went astray.

AD. Very good.

AUG. Since you have now granted what I first asked, I will not repeat that question. Consider, then, more carefully whether that syllable *per* is nothing else but *per*, and whether *son* is nothing else but *son*.

AD. I can think of absolutely nothing else.

AUG. Consider also whether the joining of these two syllables makes a *person*.

AD. By no means will I concede that. For we decided—and quite rightly—that when a sign is given we turn ourselves to the thing signified, and from consideration of that we concede or deny what is said. But as for those separately pronounced syllables, since they were sound without signification, I concede that they are just this, the sound they make.

AUG. Then it seems right, and it is your firm conviction, that there are to be no answers to questions except in regard to what is signified by the words.

AD. I don't see why it shouldn't seem right, as long as there are words.

AUG. Tell me how you would rebuff that fellow who tells us, to our amusement, that he proved that a lion came out of the mouth of a man he was debating with. For he asked whether the things we say came out of our mouth, and the other could not deny it. Then, as is easily done, he managed to make him mention a lion as he spoke. When this had happened, he began to leap up ridiculously and bear down on the other, so that just because he conceded that whatever we say comes out of our mouth, and could not deny that he had mentioned a lion, the fine fellow seemed to have vomitted up a ferocious beast.

AD. There's little difficulty in answering that clown. I would not concede that whatever we say comes out of our mouth. For we signify the things we talk about; it is not the thing signified, but the sign which does the signifying that comes out of our mouth. The only exception is when the signs themselves are being signified; we spoke of that case a little while ago.

AUG. You certainly would have been well fortified against him this way. Still, what will you say if I ask whether "person" is a noun?

AD. What but a noun?

AUG. Then, since I see you, do I see a noun?

AD. No.

AUG. Shall I draw the conclusion?

AD. Please don't, for I will denounce myself: I am not a person, since I said it was a noun when you asked if "person" was a noun. Indeed, it had seemed right before to agree with or deny what is said from a consideration of the thing signified.

AUG. Yet I don't think you fell for that answer without cause; it was a law of reason, written on our minds, that overcame your vigilance. For if I were to ask, "What is a person (man)?" you would answer, perhaps, "an animal." But if I were to ask what part of speech *person* is, you could only answer rightly with "noun." Accordingly, since a person turns out to be both a noun and an animal, what is considered in the former case is the sign and, in the second, the thing signified. Therefore, if someone asks if "person" is a noun, I have no other answer than "yes." But if he asks if it is an animal, I agree much more readily, since if he were to ask only what a "person" is, with no mention of noun or animal, the mind would hasten, by that rule of speech accepted by us, to what the two syllables signify. And there would be no answer but "animal," or even the whole definition, "a mortal, rational, animal." Is this not the case?

AD. Absolutely. But since we had conceded that it was a noun, how will we avoid that quite insulting conclusion that I am not a person?

AUG. How else than by explaining that the inference does not come from the sense in which we agreed with our questioner? Or if he affirms that it does come from this sense, there is no need for fear. For why should I be afraid to confess that I am not a "person," that is to say, two syllables?

AD. Nothing is truer. Why then does it hurt our feelings to be told, "Therefore, you are not a person," since nothing truer could be said which follows from our concessions?

AUG. Why? Because it is impossible for me not to think that the conclusion refers to what is signified by these two

syllables as soon as the words are sounded; impossible, in fact, by that very law, which naturally carries the greatest weight, that the thought turns, when the sign is heard, to the things signified.

AD. I fully concur.

IX

AUG. Now then, I want you to understand that the things signified are of greater worth than their signs. For whatever exists for the sake of something else is necessarily of less value than the thing it exists for—or do you figure it differently?

AD. I don't think I should agree to this rashly. When I say, "the manure *(coenum)*," I think this noun far surpasses what it signifies. For what offends us, when we hear it, has nothing to do with the sound of the word itself. Indeed, with just a slight change, "the manure" becomes "the azure *(coelum)*"; yet we see how great a distance separates what they signify! Accordingly, I would never attribute to this sign what we loathe in the thing it signifies. And so, I am right to prefer the first to the second. We prefer to hear the one than to touch on the other with any of our senses.

AUG. Extremely perceptive of you. Then it is false that all things are worth more than their signs.

AD. So it seems.

AUG. Then tell me what purpose you think they had who set a name to this foul and despicable thing. Do you approve of their action, or disapprove?

AD. I venture neither approval nor disapproval, and I do not know what they were after.

AUG. Can you know at least what you are after, when you pronounce this noun?

AD. Certainly I can. I wish to signify it, so that I can teach

or warn the person I am talking to what I think he should be taught or warned about it.

AUG. What is this? To teach or warn, or to be taught and warned, things that you easily do through this word, are they not more to be cherished than the noun itself?

AD. I grant that the knowledge which results from this sign must be preferred to the sign, but I do not think the same for the thing itself.

AUG. Then in our opinion, although it is false that everything should be preferred to its sign, it is nonetheless true that everything which exists for the sake of something else is of less worth than what it exists for. For knowledge of manure, for the sake of which the name was given to it, must be considered of more value than the name itself, which, in turn, must be preferred (as we have discovered) to the actual substance. The knowledge, certainly, is not preferred to the sign in question for any other reason than that the latter exists, irrefutably, for the sake of the former, and not *vice-versa.* Thus when a certain glutton—a worshipper of his stomach, the Apostle calls him [cf. *Rom.* XVI:18, and D. L. *Socrates* II, 34]—said that he lived to eat, a temperate man, listening, did not tolerate it, but said, "Would it not be much better if you ate to live?" He spoke, surely, thinking of that same rule. For the first displeased the Apostle only because he so underestimated his life, in saying that he lived for his dinner, that he thought it cheaper than the pleasure of his palate. And the second found favor with him just because he understood which of these two acts was for the sake of and subject to the other, and he taught that we should eat to live rather than live to eat.

Similarly you, perhaps, and anyone else who values things rightly would answer some loquacious lover of words who might say, "I teach that I may talk," with "Fellow, why don't you talk instead that you may teach?" And if this is true, as

you know it is, you surely see how much less valuable words must be considered than the purpose for which we use the words. For the actual use of words must be preferred to the words used, since the words exist that we use them, and we use them in order to teach. By as much as teaching is better than speaking, by so much is speech better than words. But tell me what you think might be said against this.

AD. I certainly agree that teaching is better than words, but I am not certain that nothing can be said against the proposition that everything which exists for the sake of something else is inferior to what it exists for.

AUG. We will deal with that another time more conveniently and carefully. What you have granted now is sufficient for my purposes. For you grant that knowledge of things is more to be cherished than their signs. Consequently, the knowledge of signified things must be preferred to knowledge of their signs. Does this seem right?

AD. I did not admit, did I, that the knowledge of things is above the knowledge of signs and not above just the signs themselves? For this reason I fear I do not agree with you here. Consider this case: As the noun *manure* is better than the substance it signifies, so must not knowledge of the noun also be preferred to the knowledge of the thing, although the noun itself is of less worth than that knowledge. There are evidently four items: noun, and thing, and knowledge of the noun, and of the thing. So why doesn't the third surpass the fourth as the first surpasses the second? But must it also be inferior if it is not to surpass it?

AUG. You hold your point and explain your opinion marvelously well. But you understand, I think, that the syllable we sound when we say "vice" is better than what it signifies, although knowledge of the noun itself is much less valuable than a knowledge of vices. And so, allowing those four terms

you have set up and considered—name, and thing, and knowledge of the name, and of the thing—we rightly prefer the first to the second. For this noun, set in verse, as Persius has it, "But he is stupefied with vice" [*Sat.* III:32] not only is no vice in the line, but is even something of an ornament. But the actual thing signified by this noun forces whatever it is in to be vice-ridden. Yet the third term does not also in this way surpass the fourth, but, we see, the fourth surpasses the third; for knowledge of the name is of little value compared to a knowledge of vices.

AD. And you think that such knowledge should be preferred even when it makes men wretched? For Persius also sets this punishment ahead of all those dreamed up and meted out by the cruelty and cupidity of tyrants: to force men to recognize the vices they cannot avoid.

AUG. By this reasoning you can also deny that it is necessary to prefer even the knowledge of virtues to knowledge of this noun "vice," because to see virtue without having it is the punishment our satirist wishes on tyrants.

AD. God forbid such madness. Now indeed I understand that we must not blame knowledge itself, which the best instruction of all inculcates, but that we must judge, as I think Persius has, the most wretched of all men to be those afflicted with a disease such as no medicine can help.

AUG. You understand it well; but what is Persius's opinion to us? For we are not subservient to the authority of such as he in such matters as these. If knowledge, then, in any way must be preferred to knowledge, it is not easy to explain it here. But I am satisfied if it has been established that a knowledge of signified things is to be preferred at least to the signs themselves, even if not to a knowledge of the signs.

Consequently, let us now discuss much more thoroughly the character of those things that we say can be demonstrated

through themselves, without signs—for example, speaking, walking, sitting, lying, and others of that sort.

AD. I recall what you have already said.

X

AUG. Do all those things that we can do right after we have been asked about them seem to you to be demonstrable without a sign? Or do you make an exception?

AD. Indeed, reviewing the whole group again and again I can find nothing there that can be taught without a sign except perhaps speech and—if someone should ask about the process itself—teaching. For I see that no matter what action I go through after his question to teach him, he does not learn from the action itself what he wants to be shown. If while I am reading or doing something else someone should ask me what walking is and I should try to teach him what he asked at once, without a sign, but by walking, how would I warn him against thinking that walking was only as much as I had done? But if he thought that he would be misled; for he would think that anyone who walks more or less than I had was not walking. And what I have said about this one verb holds for all those acts which I had agreed could be shown without a sign, with those two exceptions.

AUG. I accept this. But don't speaking and teaching seem to you different things?

AD. Certainly, for if they were the same no one could teach without speaking, but since in fact we learn many things with other signs than words, who can doubt the difference?

AUG. What about teaching and signifying? Are they not at all different, or somewhat?

AD. I think they are the same.

AUG. Isn't it right to say that we signify in order to learn?

AD. Quite right.

AUG. And if someone should say that we teach in order to signify, won't he be easily refuted by our previous proposition?

AD. Yes.

AUG. Then if we signify to teach, we do not teach to signify; teaching is one thing, signifying another.

AD. What you say is true, and I was wrong to answer that they are both the same.

AUG. Does someone teach what teaching is by signifying or by some other means?

AD. I don't see how else he could do it.

AUG. Then what you said a little before is false, that the question, "What is teaching itself?" could be answered without signs, since we see that not even this can be answered without signification inasmuch as you granted that teaching is one thing and signifying another. For if they are different—as is the case—and if the first can not be demonstrated unless through the second, then assuredly it is not demonstrated through itself —as had seemed to you the case. Accordingly, nothing has yet been found that can be shown through itself except speech, which signifies, among other things, itself. However, since it is itself a sign, absolutely nothing exists that it seems possible to teach without signs.

AD. I have no reason not to agree.

AUG. It has been established, then, that nothing can be taught without signs and that we ought to cherish knowledge itself more than the signs by which we get knowledge, although not everything that can be signified is to be preferred to its sign.

AD. So it seems.

AUG. Do you remember by how long and roundabout a way so small a result has at last been reached? For we have been tossing words about for a long time and labored to discover three things: whether anything can be taught without

signs, whether some signs must be preferred to the things that they signify, and whether the actual knowledge of things is better than their signs. But there is a fourth thing that I would like to learn briefly from you: whether you can have no doubts about what has been found out this way?

AD. I do indeed wish that after so many bends and windings we had reached certainty; but that question of yours somehow bothers me and restrains me from agreeing. For it seems to me that you would not have asked it unless you had something to say against them; and the very complexity of these matters does not allow me to see them as a whole and respond with assurance, for fear lest in so many windings something lies hid that the keenness of my mind cannot penetrate.

AUG. I gladly welcome your hesitation, for it is a sign of the least rash spirit, and that is the greatest preserver of peace of mind. For assuredly it is most difficult not to be disturbed when those ideas that we were quickly and easily convinced of are knocked over by contrary arguments and twisted from our hands. In consequence, just as it is right to yield to carefully deliberated and thoroughly examined arguments, it is dangerous to take what is unknown for known. We should certainly be afraid that the frequent overthrow of what we took to be most firmly and permanently established will lead us into so great a hatred or fear of reason that it no longer seems necessary to have faith in the clarity of truth itself.

But now let us consider again, more quickly, whether your doubts are right. Consider this case: A man ignorant of the use of twigs and lime in birdcatching meets a fowler, armed with his equipment, but on the road, not at work. He would stand still in astonishment at the sight and would ask himself what kind of man would deck himself out like that. The fowler,

when he saw himself stared at, would prepare his reeds with a desire to display himself, and using his stick and falcon would fix, subdue, and capture some little bird noticed nearby. Would he not teach his spectator with no use of signification, but by the thing itself, what that one wanted to know?

AD. I am afraid he is like the one I mentioned before, who asked what walking is. I do not see in this case, either, that fowling has been totally demonstrated.

AUG. It is easy to free you from this worry. I can add the condition that the spectator is intelligent enough to infer the whole character of the art from what some he sees. For it is enough for our argument that some men can be taught some things, although not all, without a sign.

AD. I, too, can add this condition for the other situation: if the spectator is truly intelligent, from the few steps of the demonstration he will understand the whole of walking.

AUG. I will allow you to; I not only don't object, I applaud it. For, you see, we have each established that some things can be taught some men without signs, and that what seemed right to us before is wrong, namely, the existence of nothing at all that could be revealed without signs. Indeed, now not just one or two, but thousands of things spring to mind that, without the use of a sign, can be demonstrated through themselves.

Indeed, tell me why we should doubt it. Forget the countless spectacles in all the theaters where men produce exhibitions not by signs but by the thing itself; surely the sun up there, and the light flooding and clothing everything here, the moon and the other stars, the earth and the seas, and all that exists in them—do not God and nature show and display these through themselves to those who look?

But if we were to look into it more carefully, perhaps

you would find nothing which is taught by its sign. For when I am given a sign, if I am ignorant of the thing it is a sign of, it cannot teach me anything; but if I already know, what do I learn through the sign? For example, when I read, "their *saraballae* were not altered" [*Dan.* III:27], the word there does not show me what it signifies. For if certain coverings for the head are meant by this noun, did I learn, at the sound of it, either what a head is, or what coverings are? I become acquainted with these things not when they are named by others, but when they are seen by me. In fact, when that syllable *head* first struck my ears I was as ignorant of what it signified as I was when I first heard or read *saraballae*. But after it had been spoken again and again, I discovered, by taking note of when it was said, that it was a word for a thing already well known to me by sight. Before I discovered this the word was only a sound to me. But I learned that it was a sign when I found out what it was a sign of. And I learned this, as I said, not through the process of signification but by sight. Thus, it is rather the case that we learn the sign when we know the thing than that we learn the thing when the sign is given.

To understand this more clearly, imagine that we are now hearing for the first time the word "head" and that, being ignorant whether that expression is just a sound or is also a sign, we ask "What is *head*?" (Remember, we wish to become acquainted not with the thing signified but with the sign itself. We completely lack acquaintance with the sign as long as we don't know what it is a sign of.) If someone then points to the thing itself with his finger, we learn at this sight the sign that we had only heard and not yet known. Yet although the two qualities of sound and signification are both in this sign, we certainly do not perceive the sound through the signification but rather because of its striking the ear; the signification, on

the other hand, we perceive by the sight of what is signified. For the pointing of the finger can only signify that at which the finger points; moreover, it points not at a sign but at that part which is called "head." So from that pointing I cannot learn a thing I had already known, nor a sign which is not being pointed at.

But I am not very concerned with the pointing of the finger, since I think it is a sign of the demonstration rather than of the objects demonstrated, just like the interjection "*Look!*" For we usually say this as we point, in case just one sign of demonstration should not be enough. Most of all, I am anxious to persuade you—if I can—that we learn nothing through those signs which we call *words*. Instead we learn, as I have said, the force of the word, that is, the signification hid in the sound, from knowledge of the thing signified, and we do not perceive the thing from the signification.

And what I have said about the head I could also say about the coverings and countless other things. These, however, I already know, but those *saraballae* I still have no knowledge of. If someone should signify them to me with a gesture, or paint a picture of them, or show me something to which they are similar, I would not say then that he has not taught me what they are—although I easily could, if I spoke at greater length—but I would say what is very close to that: He has not taught it to me with words.

And if it should happen that just as I was looking at them he declared to me, "Look! *saraballae*," I would learn then something I had not known, not, however, through the words spoken but through the sight of it. And through the sight I could also learn and retain the value of that noun. For when I learned the actual thing I heeded not someone else's words but my own eyes; the words, perhaps, I heeded in order to

direct my attention, so I might seek from the sight what I was to see.

XI

To give them the greatest credit possible, words have this power: they prompt us to look for objects, but they do not display them for us to learn. And the person who teaches me something supplies my eyes, or another of the bodily senses, or even my mind with whatever I want to know. From words, consequently, we learn only words, or rather the sound and noise of words; for if what is not a sign cannot be a word, then even once I have heard it I do not know that a word is a word until I know what it is a sign of.

With the knowledge of things, therefore, knowledge of words comes, too; but when words are heard, they are not learned. For we do not learn the ones we already know, and we cannot declare that we have learned the ones we did not know until we become aware of their signification; and that awareness comes not from hearing voices but with knowledge of the things signified.

Here indeed is the truest argument and the one most truly spoken: when words are expressed we either do or do not know what they signify. If we do know, we are remembering rather than learning them. But if we do not know, we certainly do not remember them but are perhaps prompted to seek for their meaning.

But what if you should say this: those head-coverings, to be sure, of which we grasp the name only by its sound, we cannot get to know except by sight, and we cannot know the name itself more fully except by acquaintance with the actual things; nonetheless, what we hear of the boys, how they overcame the king and the fire through faith and religion, what

praises they sang to God, what esteem they won even from their enemy—do we learn this through anything but words?

I will answer that everything signified by those words was already in our knowledge. For the meanings of "three boys," "furnace," "fire," "king," even of "unharmed by the fire" and of everything else signified by those words were already in my comprehension. But Ananias and Azarias and Misael are as unknown to me as those *saraballae*. And these names have not and could not have in any way aided me in getting to know them.

Indeed, I confess that I believe rather than know that all the events to be read in that story took place at that time just as they are written. And the very authors we do believe were well aware of that difference. Thus the Prophet says: "If you should not believe you shall not understand" [*Is.* VII:9]. He certainly would not have said this if he did not deem them separate. As much as I understand, therefore, I also believe, but I do not also understand all that I believe. Furthermore, everything that I understand, I know, but I do not know everything that I believe. But I am not for this reason unaware how useful it is to believe many things still that I do not know. In this useful category I place the story of the three boys. Thus, although there are many things I cannot know, I know the usefulness of believing them.

Part two: The only teacher of truth is Christ

Now then, in regard to the classes of things we understand, we seek advice not from the speaker outside of ourselves but from the truth within that governs our mind, while the words, perhaps, prompt us to seek advice. And he to whom we go for aid is the teacher, Christ, who is said to dwell in the innermost

man, the inalterable strength and eternal wisdom of God. Indeed, every rational soul consults this, but it is available to each only to the extent he can grasp it by virtue of his own good or bad will. If it is ever deceived, it is not the fault of the truth consulted, just as a mistake of the bodily eyes is not the fault of the exterior light. We admit that we seek help from the light to show us visible things to the extent that we have the strength to discern them.

XII

But if in regard to colors we seek aid from the light, and in regard to the other things that we sense through the body we consult the elements of this world, the very bodies that we sense, and the very senses that the mind uses as interpreters to learn such matters, and if in regard to matters that we understand we take counsel, by means of reason, from the truth within us, what, then, can be said to prove that we learn anything through words beyond the actual sound that strikes our ears?

For we perceive everything with either the physical senses or the mind. The former we label "sensible," the latter "intelligible," or, to speak as our authors do, the former are "carnal," the latter "spiritual."

When we are asked about the first, we answer, if the sensible objects are at hand—for example, if we are asked while we look at it about the nature and position of the new moon. The man who asked, if he does not see it, believes our words, or perhaps he does not. But in no way does he learn, if he does not also see what we are speaking of. In that case he has learned not from the sound of the words but from the subjects themselves and from his senses. For the words sound the same to one who sees as to one who doesn't.

When, however, the question concerns not our immediate sensations, but things we once sensed, we no longer speak of the actual things but of the images taken from them and committed to memory. I do not know at all how it is we say these to be real when what we contemplate is not, unless it is because we declare not that we see and feel them, but that we have seen and felt them. Thus, those images in the storehouse of our memory are treated by us as documents of what we previously felt. We contemplate these in the mind and with a good conscience we do not lie when we talk. To us they are documents. Now the man who hears me, if he sensed these things and was present does not learn them from my words but recognizes the images he himself carried away. But if he did not himself experience them, who would not suppose that he is believing my words rather than learning from them?

Yet when it is a question of what we contemplate with the mind, that is, by intellect and reason, we speak of those very things whose presence we see in that interior light of truth from which he whom we call the inner man derives light and enjoyment. But in that case, too, if our listener himself sees them with his hidden, open eye, he knows what I am saying from his own contemplation, not from my words.

Therefore I, who speak the truth, teach not even him, who regards the truth. For he learns not from my words but from the things themselves, which are made plain as God displays them within. And so, were he questioned about these, he, too, could answer. So what is more absurd than to think that he was taught by my speech, since, if asked, he could, even before I spoke, explain these very things.

It often happens that someone will deny something he has been asked and then admit it after he has been pressed by other questions. This comes from his weakness in this kind of contemplation, inasmuch as he is unable to take the aid of

that light on the whole matter. He is prompted to do this by parts when he is asked about those parts that make up a sum that he had not the ability to see as a whole. Similarly, if I asked you our present question, "Can nothing be taught with words?" at first you would think it absurd, being unable to see the whole. It would, therefore, be right for me to question you in accordance with your ability to hear that teacher within and say, "Where did you learn what you concede to be true in my speech, and what you are sure of, and what you assert that you know?" Perhaps you would answer what I have taught.

Then I might add, "What if I were to say that I saw a man flying? Would my words leave you as certain as you be if you heard that wise men are better than fools?" You would deny it at once and answer that you did not believe my first statement, or, even if you did believe it, you had no knowledge of it, but that my second statement you knew with assurance to be a fact. From this you would surely understand that neither in the first case, where you remained without knowledge of what I declared, nor in the second, where you knew it perfectly well, did you learn anything from my words. For asked about the individual facts, you would certainly have sworn that one was unknown, one known to you.

Then indeed you would admit the whole idea that you had denied, when you realized that the pieces of which it was composed were clear and certain. Obviously our audience, in regard to everything that we say, either does not know if it is true, or is not ignorant than it is false, or knows that it is true. Of these three possibilities, the first is grounds for belief, opinion, or doubt; the second, for opposition and denial; the third, for affirmation. Nowhere, then, is learning. For the one who knows nothing of the subject after I have spoken, and the

one who knows that what he heard was false, and the one who, if asked, could have given the same answer that I gave—all these are proven to have learned nothing from words.

XIII

For this reason, anyone unable to perceive subjects that are perceived by the mind listens in vain to the speeches of someone who can, and if not in vain, only because it is useful to believe such things as long as he is ignorant of them. But anyone who *can* see them is a student of the truth within and, in the outer world, a judge of the speaker or, rather, of the speech itself.

For most of the time he knows the things that are said, while the speaker himself is ignorant of what he says. For example, a follower of the Epicureans, who believed in the mortality of the soul, might make an oration in which he used the arguments put forth by wiser men to prove its immortality while one who could contemplate spiritual subjects listened. This man would judge that the orator does speak the truth, but the speaker does not know if he does, or, rather, he even thinks it entirely false. Must he, then, be thought to teach the things he doesn't know? Yet he uses the very words he could use if he did know. For this reason it is not even left to words to indicate the thoughts of the speaker, since it is uncertain if he knows what he is saying.

Add, too, liars and deceivers; they will easily make you understand that words not only don't open but even hide the mind. For in no way do I doubt that the words of truthful men attempt it, and to some extent do speak openly, so that the speaker's mind is seen. Everyone agrees that they would attain this if liars were not allowed to talk.

Nevertheless, we have often had the experience, both among ourselves and among others, of words being expressed that did not correspond to what was on the mind. I see two ways for this to happen: we recite automatically a speech that we have committed to memory, and frequently gone over, while thinking of other things (this often happens to us when we sing a hymn), or words other than those intended leap out against our will, by the tongue's own error—for in this case also the signs heard are not of what we have in mind. For liars too think about the things they are saying as well, so that even if we do not know if they are speaking the truth, we do know that they are saying what they have in mind as long as one of these two accidents doesn't befall them. And if someone should maintain that this happens only occasionally and that it is obvious when it does happen, I would not argue with him, although it is often hidden and does deceive me, as a listener.

There is a kind of accident different from these that occurs very widely and is the source of countless arguments and disagreements: when the speaker signifies what he is in fact thinking, but for the most part only to himself and some others, while to the listener and many others as well he does not signify the same thing. For example, someone might say that man is surpassed in manliness [*virtus*] by some of the wild beasts. We would immediately find this unbearable and refute with great eagerness so false and dangerous an opinion. But perhaps he calls bodily strength "manliness," and so with this noun he is expressing what he thinks and is not lying, or confusing matters, or putting together memorized words while thinking about something else, or saying what he does not think through a slip of the tongue. It is only that he calls what he is thinking by a different name than we do. We would agree with him at once if we could look in and see the thought that he has not

been able to open up to us even when the words have been expressed and his opinion set out.

Some say that definition is a remedy for this confusion. In this case the speaker could define "manliness." He would make it clear, they say, that the argument was about the word, not the proposition. Granting this, how many men skillful at defining can be found? Still, there are many things said against the science of definition that it is not convenient to discuss now and that I am not altogether satisfied with.

I am leaving out the fact that we do not hear many things correctly and argue long and loud about them as if they had been heard. Thus, recently, when I had said that a certain Punic word signified "pity," you said that you had heard from those who knew better that it meant "compassion." But I objected maintaining that you had completely forgotten what you had heard, for it seemed to me that you had said not "compassion" but "faith," although you were sitting very close to me and there is no way the sounds of those two words might deceive the ear by their similarity. Nevertheless, for a long time I thought that you did not know what had been said to you, while I did not know what you had said. For if I had heard you right, I would have found it in no way absurd for one Punic word to indicate both pity and compassion.

This happens very often, but we leave this case out, as I said, lest I should seem to reproach words for the negligence of the listener or even for the deafness of men. The cases I enumerated before trouble us more, in which we are unable to become acquainted with the thoughts of the person speaking from words clearly heard and in Latin, our own language.

But look, I will relent and concede that when the words are heard by someone to whom they are known, it is possible for him to know what the speaker thought about those subjects

signified by the words. He doesn't also, does he, learn for this reason what is now the question: if he speaks the truth?

XIV

Do teachers proclaim that what is perceived and retained are their thoughts and not the science that they think they hand on by speaking? For who is so foolishly curious that he sends his son to school to learn what the teacher thinks? But when they have explained, through words, all those sciences that they profess to teach, even the sciences of wisdom and virtue, then those called students consider within themselves whether the truth was spoken, looking, in fact, at that truth within them to the extent they are able. It is then that they learn, and when they find, within themselves, that the truth has been spoken, they give praise. They are unaware that they are not praising the teachers rather than the taught—if at least these teachers, too, know what they are saying.

Moreover, since most of the time there is no delay between the time of speech and of thought, men make the mistake of calling teachers those who are not. And since they learn, within, immediately after the prompting of the speaker, they think that they learn outside themselves from the one who prompted them.

But we will investigate elsewhere, if God allows, the whole utility of words; when well considered, it is not found small. But now, I urge you, let us not credit them with more than their due, so that we may not only believe but also begin to understand already how truly it has been written by divine order that we are not to call anyone on earth a teacher, because there is in heaven one teacher of all men [*Matt.* XXIII: 8–10].

What, moreover, He is in heaven, He himself will teach us; He by whom we are prompted, through men, with signs outside ourselves, to turn to him inside and be taught our les-

sons; He of whom knowledge and love make up the blessed life, a life which all proclaim that they seek, but which few rejoice to have truly found.

But now I would like you to tell me what you think of my whole discourse. For if you acknowledge that what has been said is true, when asked about the individual statements you would also have said that you knew these things. You see therefore from whom you learned all this, and that it was not from me, since you only answered my questions. But if you do not recognize them as true, neither I nor He taught you. Not I, because I can never teach; not He, because you still can not learn.

AD. I indeed have learned at the prompting of your words that words do nothing else than prompt men to learn and that it is a minor thing that some portion of the speaker's thought becomes evident through words. I have learned, moreover, that only He can teach us whether the truth is spoken, He who warns us when there is speech outside that He dwells within.

Nonetheless, I am most thankful for the uninterrupted discourse that you delivered, because it forestalled and defeated everything I had ready to say against it. And you have left aside absolutely nothing that was causing doubt for me, nothing about which that hidden oracle would not answer me just as your words asserted.

G. W. Leibniz / From

Discourse on metaphysics

XXIV. *What clear and obscure, distinct and confused, adequate and inadequate, intuitive and suppositive knowledge is, and nominal, real, causal and essential definition.* In order to understand better the nature of ideas it is necessary to touch somewhat upon the various kinds of knowledge. When I am able to recognize a thing among others, without being able to say in what its differences or characteristics consist, the knowledge is *confused*. Sometimes indeed we may know clearly, that is with-

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out being in the slightest doubt, that a poem or a picture is well or badly done because there is in it an "I know not what" which satisfies or shocks us. Such knowledge is not yet distinct. It is when I am able to explain the peculiarities which a thing has, that the knowledge is called *distinct*. Such is the knowledge of an assayer who discerns the true gold from the false by means of certain tests or marks which make up the definition of gold. But distinct knowledge has degrees, because ordinarily the conceptions which enter into the definitions will themselves be in need of definition, and are only known confusedly. When at length everything which enters into a definition or into distinct knowledge is known distinctly, even back to the primitive conception, I call that knowledge *adequate*. When my mind understands at once and distinctly all the primitive ingredients of a conception, then we have *intuitive* knowledge. This is extremely rare, as most human knowledge is only confused or suppositive. It is well also to distinguish nominal from real definition. I call a definition *nominal* when there can be doubt whether the concept is possible; as for instance, when I say that an endless screw is a line in three dimensional space whose parts are congruent or fall one upon another. Now although this is one of the reciprocal properties of an endless screw, he who did not know by other means what an endless screw was could doubt if such a line were possible, because the other lines whose parts are congruent (there are only two: the circumference of a circle and the straight line) are plane figures, that is to say they can be described *in plano*. This instance enables us to see that any reciprocal property can serve as a nominal definition, but when the property brings us to see the possibility of a thing it makes the definition *real*, and as long as one has only a nominal definition he cannot be sure of the consequences which he draws, because if it conceals a contradiction or an impossibility he would be able to draw the opposite conclusions. That is why

truths do not depend upon names and are not arbitrary, as some of our new philosophers think. There is also a considerable difference among real definitions, for when the possibility is proved only by experience, as in the definition of quicksilver, whose possibility we know because such a body, which is both an extremely heavy fluid and quite volatile, actually exists, the definition is merely real and nothing more. If, however, the proof of the possibility is a priori, the definition is not only real but also *causal*, as for instance when it contains the possible generation of a thing. Finally, when the definition, without assuming anything which requires a proof a priori of its possibility, carries the analysis clear to the primitive concepts, the definition is perfect or *essential*.

XXV. *In what cases knowledge is added to mere contemplation of the idea.* Now it is manifest that we have no idea of a concept when it is impossible. And in the case of suppositive knowledge, even if we have an idea, we do not fully grasp it, because such a concept is known only in the same manner as concepts that are covertly impossible. And even if it is in fact possible, it is not by this kind of knowledge that we learn its possibility. For instance, when I am thinking of a thousand or of a chiliagon, I frequently do it without contemplating the idea. Even if I say a thousand is ten times a hundred, I frequently do not trouble to think what ten and a hundred are, because I assume that I know, and I do not consider it necessary to stop just at present to conceive of them. Therefore it may well happen, as it in fact does happen often enough, that I am mistaken in regard to a concept which I assume that I understand, although it is an impossible truth or at least is incompatible with others with which I join it, and whether I am mistaken or not, this suppositive sort of knowledge remains the same. It is, then, only when our knowledge is clear in regard to

confused conceptions, and when it is intuitive in regard to those which are distinct, that we see its entire idea.

XXVI. *Ideas are all stored up within us. Plato's doctrine of reminiscence.* In order to see clearly what an idea is, we must guard ourselves against a misunderstanding. Many regard the idea as the form or the differentiation of our thinking, and according to this opinion we have the idea in our mind only in so far as we are thinking of it, and each separate time that we think of it anew we have another idea although similar to the preceding one. Some, however, take the idea as the immediate object of thought, or as a permanent form which remains even when we are no longer contemplating it. As a matter of fact our soul has the power of representing to itself any form or nature whenever the occasion comes for thinking about it, and I think that this activity of our soul is, so far as it expresses some nature, form or essence, properly the idea of the thing. This is in us, and is always in us, whether we are thinking of it or no. (Our soul expresses God and the universe and all essences as well as all existences.) This position is in accord with my principles that nothing enters naturally into our minds from outside.

It is a bad habit we have of thinking as though our minds receive certain messengers, as it were, or as if they had doors or windows. We have in our minds all those forms for all periods of time because the mind at every moment expresses all its future thoughts and already thinks confusedly everything that it will ever think distinctly. Nothing can be taught us of which we have not already in our minds the idea. This idea is as it were the material out of which the thought will form itself. This is what Plato has excellently brought out in his doctrine of reminiscence, a doctrine which contains a great deal of truth, provided that it is properly understood and purged of the error of pre-existence, and provided that one does not conceive of

the soul as having already known and thought at some other time what it learns and thinks now. Plato has also confirmed his position by a beautiful experiment. He introduces [*Meno*] a boy whom he leads, by short steps, to extremely difficult truths of geometry bearing on incommensurables, all this without teaching the boy anything, merely drawing out replies by a well-arranged series of questions. This shows that the soul virtually knows those things, and needs only to turn its attention to them to recognize the truth. Consequently it possesses at least the idea upon which those truths depend. We may say even that it already possesses those truths, if we consider them as the relations of the ideas.

XXVII. *In what respect our souls can be compared to blank tablets and how conceptions are derived from the senses.* Aristotle preferred to compare our souls to blank tablets prepared for writing, and he maintained that nothing is in the understanding which does not come through the senses. This position is in accord with the popular conceptions, as Aristotle's approach usually is. Plato thinks more profoundly. Such tenets or practicologies are nevertheless allowable in ordinary use somewhat in the same way as those who accept the Copernican theory still continue to speak of the rising and setting of the sun. I find indeed that these usages can be given a real meaning containing no error, quite in the same way as I have already pointed out that we may truly say particular substances act upon one another. In this same sense we may say that knowledge is received from without through the medium of the senses because certain exterior things contain or express more particularly the causes which determine us to certain thoughts. When, however, we are dealing with the exactness of metaphysical truths, it is important to recognize the powers and independence of the soul which extend infinitely further than is

commonly supposed. In the ordinary uses of life we attribute to the soul only that which belongs to it most manifestly and particularly, and there is no advantage in going further. In order, therefore, to avoid misunderstandings it would be well to choose separate terms for the two. These expressions which are in the soul whether one is conceiving of them or not may be called *ideas*, while those which one conceives of or constructs may be called *conceptions*. But whatever terms are used, it is always false to say that all our conceptions come from the so-called external senses, because those conceptions which I have of myself and of my thoughts, and consequently of being, of substance, of action, of identity, and of many others come from an inner experience. . . .

Friedrich Nietzsche / From *Introduction to the study of the Platonic dialogues*

Amicus Plato, sed . . . Plato and his predecessors, an effort to serve those who want to read Plato and think it is necessary to be prepared for it.

[*Introduction, 367–369*

Chapter I–1. RECENT LITERATURE ON PLATO, 369–377; 2. PLATO'S LIFE, I–VI, 377–382]

VII. Survey of the life

. . . His legislative mission is to be understood as the central point of Plato's concern. He considers himself among the

From GESAMMELTE WERKE, *Friedrich Nietzsche, Band IV, "Vorträge, Schriften und Vorlesungen 1871–76" (Musarion, 1921), pp. 365–443. The translation is by Malcolm Brown and Gertrud Weiler and appears here for the first time. Titles of omitted sections are given in brackets. These*

Solons, Lycurguses and so on. He does everything from that point of view: his life would otherwise be hateful to him. His way of life shows how he wanted to be a model to be imitated: he had to live in such a way as to become ever more appropriate for his ideal. His friendships and his acquaintances have this background only. He never gave up on this: see that Letter [7th] and the *Laws*. He always lived with a terrible suffering: he never would accomplish anything similar. In the Academy he disseminates seeds for the future and writes only with this object in mind.

The precondition for such a mission is the *unconditional belief* in *oneself*. This is evident, for example, in the fact that his only way of idealizing Socrates is to make him like himself. He considers his own tendency the only hope for any state, and accordingly he is much at odds with all other efforts, especially where they were expounded spiritedly. This is why the ancients called him *philotimos* (fond of honor) and recounted stories of his falling out with all the great men of his time. It was the sublimity of his tendency that produced this exclusivity, for which gifted men were the greatest harm. In all his actions he was accompanied by the highest pathos: it was already reported of the young Plato that he never laughed excessively. The exclusivity is especially astonishing in the field of art; he rejects the

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excerpts are from Nietzsche's lectures on Plato given under the title "Introduction to the Study of the Platonic Dialogues" in Basel during winter 1871–72 and winter 1873–74. He used the same lecture plan for the summer session of 1876 there, but changed the title to "Plato's Life and Doctrines." It is probable that these lectures were not intended for publication, but on one occasion (1876) Nietzsche retitled his intended book about Philosophy in the Tragic Era "Plato and his Predecessors" (Musarion IV, "Nachbericht," p. 452). This title may be taken to imply an intention to make public at least the content *of these lectures.*

whole of ancient culture and sets himself up in opposition to Homer. For education in his best state he thinks *his* works are the normative ones. Everything else is measured only in terms of them.

He holds that only very few are competent to understand the theory of Ideas: in this sphere he has something arcane-mysterious [*Geheimnissvoll-Mysteriöses*] about him. It is dialectical truths from this highest sphere on which all his reforms depend, and he does not speak of it before the exoteric. The opposition between a world of appearance and a reality lying behind it is the strangest one, and to the many it is silly. The ways to those truths of Ideas are shown to be as follows: (1) the Heraclitean change of all things, (2) the firm Socratic *eidē* (Ideas), (3) the mediating Pythagorean wandering of the soul, *epistēmē, anamnēsis* (knowledge, recollection). He cannot have written before his acquaintance with the Pythagoreans. In the *Phaedrus* he recommends keeping a close relation between writing and actual *logoi* (discourses). These are certainly not those of Socrates, therefore those of the Academy. Here we believe the tradition [cf. D. L. III, 38, quoted by Nietzsche in section V] that the *Phaedrus* is the first dialogue: but not composed before his forty-first year. Thus all his writings fall in the second half of his life: we think we are forced to believe in a decline in his power of artistic representation. First: *Phaedrus, Symposium, Republic, Timaeus,* [!] *Phaedo;* late: *Theaetetus, Sophist, Statesman, Philebus, Parmenides, Laws.* . . .

[3. Introduction to the individual dialogues, 20 major and 31 "minor" works. Notes on the *Meno* (giving outline of its contents) not published in Musarion.]

Chapter II. Plato's philosophy as the chief testimony for Plato the man

1. TWO KINDS OF KNOWLEDGE

Timaeus 51D distinguishes: knowledge of reason (*nous*) and right opinion (*doxa alēthēs*). They are different since they have different origins: 1 by teaching, 2 by persuasion; 1 grounded, 2 ungrounded; 1 not to be shaken by persuasion, 2 changed by it; in 1 only gods and a few men participants, in 2 all men.

Two kinds of objects of knowledge: the *Ideas* unchangeable and identical to themselves, immortal, ungenerated; *material* things changeable, generated, mortal, corruptible.

2. POSSIBILITY OF KNOWLEDGE

. . . Plato believes with Heraclitus that every *individual* is in constant flux; with the help of Socrates he found the *universal* definitions of concepts: as our individual perceptions of sense [*Anschauungen*] correspond to *individual* objects, so our universal concepts should correspond to objects, unchangeable like the concept itself. The concept (*noēma*) could not be merely in the soul without having its equivalent in actuality. Herbart: "One should think of these universal concepts as truths about real objects, of which each in its kind, like the corresponding concept, is only here once: these real objects are the Platonic Ideas." There correspond to the concepts only so many actual things as are known by it. The unchangeable is not perhaps the character of the species and the law of nature, but exists *alongside* the individual and *beyond* change (not *in* the individual, not *through* change). . . .

[3. RELATION TO THE DOCTRINE OF HERACLITUS; 4. RELATION TO CRATYLUS; 5. INFLUENCE OF SOCRATES; 6. THE BATTLE AGAINST "SENSE"]

7. SOCRATIC CONCEPTS

What is *just*, what is *beautiful?* We never see the Just, the Beautiful, but always only name an individual beautiful, just. What have we drawn these concepts from? Not from experience. Rather we begin by bringing them into experience and apply them to experience. We have them *in us;* thus there is something which although not first *in sensu* yet after was *in intellectu*. Nobody has seen the Beautiful, the Equal and so forth; then how do we know something of them? The cardinal question about the *Origin of Concepts* comes into being. One must think that Plato started from abstractions like good, beautiful, just, not from the concept horse. He denied that abstraction is *abstracted* [*abstrahirt*]. For how could the always permanent be abstracted from the always changing?

8. CRITIQUE OF THE FACULTY OF KNOWLEDGE

There are (1) images, dependent on senses, changeable, subject to error and paradox, they make men bad and sensual, perturbed; (2) concepts, nonsensible, without correlate in the world of the senses, persisting, make men ethical, quiet, firm like Socrates. As the foundation of good character, logical thinking; unlogical images and opinions as the foundation of bad character.

9. DISTINCTION OF TWO KINDS OF BEING

As opinion (*doxa*) is related to knowledge (*epistēmē*), so must the empirical world of becoming be related to a world of being. The fact that we actually have *epistēmē* proves a world of being. Empirical existence is a wholly bad and incomplete kind of being, corresponding to *doxa*, the incomplete and bad kind of thought. *Doxa* refers to the world of sense; *epistēmē* to—what? The representing and the thing represented go together,

the thinking and what is thought. What is the content or the object of thought? What is the being which is known through thinking? What is the correlate of the concept as the world of sense is the correlate of *doxa?* Knowledge can refer only to true being. But he learned from Socrates that there is a knowledge: yet Socrates did not find the objects, since he did not find the pure concepts. But he found the method by which one must seek concepts. This is *dialectic.*

10. DIALECTIC AS THE WAY TO KNOWLEDGE OF BEING

Only a concept which has been outlined with full accuracy, its boundaries known to be sound on all sides, can open the way to being. One must therefore try to hunt out the concept dialectically, overcome all unclear thinking, eliminate everything deceptive and ambiguous. This is precisely the *life-task* of the philosopher to find the realm of concepts, derive them individually, to publicize full knowledge. All instruction in the Academy is founded on dialectic. Plato knows nothing of an intuitive [*intuitiven*] grasping of Ideas; the way to the concept is *always* dialectic. There necessarily corresponds to the correct concept a real thing, but one which cannot possibly be seen or sensed otherwise than through this very concept. Teaching by dialectic is set opposite to persuading through rhetoric and writing. The latter produces no knowledge, but only *doxa.*

11. THE MODEL OF THE PERFECT PHILOSOPHER

He lives entirely among purest abstractions, sees and hears no more, does not appreciate any more what men in general appreciate, hates the actual world and tries to pass on to others his contempt. He lives as if in a cave after he has seen the light of day and the true *onta* (beings): other men must take him for crazy when he recommends that they no longer believe in the reality of things that they see and hear. The Platonic man is

quite distinct from the Socratic: for Socrates says (Xenophon, *Memorabilia* III,9), "The best man and the one most loved by the gods is the one who, as farmer fulfils the duties of farming well, as doctor those of the medical art, in political life his duties in relation to the state. The man who does nothing well, however, is neither useful nor pleasing to the gods." Socrates was a good citizen [*Bürger*], Plato a bad one, as Niebuhr dared to state.

That is to say, he entered on a life-and-death struggle against all established political institutions and was a revolutionary of the most radical sort. The demand that one form the right concepts of everything sounds harmless: but the philosopher who thinks himself to have found them handles all other men as fools and immoral people and all their institutions as folly and hindrances to true thinking. The man who has the right thoughts [*Begriffe*] wants to *judge* and *be master* [*herrschen*]: the conviction that one possesses the truth makes one fanatic.

This philosophy came from a contempt for actuality and men: very soon it manifested a tyrannical trait. Plato seems to have got the decisive thought through his *Apology of Socrates*, how a philosopher has to behave toward men: as their doctor, as gadfly on the neck of mankind. He intensifies the ideal and forms the thought: *scientific knowledge* should *rule*. The knower, who is the nearest to the gods, should be a lawgiver and founder of cities. The methods which he uses are: attachment to the Pythagoreans, practical experiments in Syracuse, founding of the Academy, writing and tireless struggle against his time. . . .

[12. A FALSE DERIVATION OF THE PLATONIC THEORY OF IDEAS; 13. OPPOSITION OF SCIENTIFIC KNOWLEDGE AND ART; 14. DID PLATO BEGIN WITH AESTHETIC IDEAS?; 15. OTHER COUNTEREVIDENCES AGAINST THE AESTHETIC DERIVATION]

16. THE ETHICAL ELEMENT IN THE GENESIS OF THE THEORY OF IDEAS

. . . Here we recognize the predominating element in Plato's psyche: it will also have been active in generating the theory of Ideas. The task was to find that world which the truly good man recognizes as *his* world, where he is no longer perturbed and seduced, where all sensuality is still, where there is no more seeing, hearing, or feeling. Being good, perfect belongs to the essence of every idea; not aesthetic perfection, but ethical. . . . The ethical has absolutely nothing to do with forms and lines: *to agathon* (the good) is *aidion* [?](unseen). Even the idea of the Beautiful is for Plato completely bodiless and colorless and should not be compared (*Symp.* 211A) with anything particular, bodily or spiritual. Nothing of appearance belongs any more to it. The beautiful appearance is a distracting accessory, the very lowest step on the ladder of beauty. That is not an artist talking, but an ethical philosopher, who permits *to kalon* to be absorbed into *to agathon.* Evil cannot belong to the genuine essence of things; it presents itself to be felt immediately as a should-not-be [*ein Nichtseinsollendes*]. One cannot separate evil itself from the drive to avoid it and thus alter one's condition. In evil we *feel* contradiction in actual reality. True essence can only be purely good and perfect. . . .

[17. ON THE PYTHAGOREAN ELEMENT IN THE THEORY OF IDEAS; 18. NUMBERS IN THE PYTHAGOREANS; 19. THE PYTHAGOREAN THEORY OF IMMORTALITY; 20. THE PYTHAGOREAN EVALUATION OF ACTUALITY; 21. REGISTER OF INFLUENCES ON PLATO; 22. THE GENESIS OF THE PHILOSOPHER (PHAEDO 96–102)]

23. PLATO AS ETHICAL PHILOSOPHER

The dominating force of Plato lies in the ethical: and right here he is in the middle position in a battle: on the one side are the

elder Athenians, led by the *kaloi kagathoi*, who cling to the traditional mores; on the other side the Sophists, who shake the traditional foundations. To the former he demonstrates the unsatisfactoriness of and the lack of rational foundation to their concepts of virtue, since instead of holding onto the essence of virtue, they held onto this or that salient feature of it. The way of the short dialogue is like this: the concept of a virtue—e.g., *sōphrosynē* (self-control)—is set up, the particular aspects of the concept investigated, filled out, corrected and then the whole concept is refuted again; a second, a third concept are set up, modified and again are dropped and the whole conversation ends with a doubt *(Charmides, Laches, Euthyphro, Meno)*. Thus Plato fights against the representatives of conventional concepts of virtue.

The cardinal proposition of the Sophists is the *identity* of *hēdu* (pleasing) and *agathon* (good). This becomes especially clear in *Gorgias:* after Callicles has once been forced to concede the distinction between *hēdu* and *agathon*, he also has to retreat from all the other propositions of Sophistry. The proofs against the identity are found in *Gorgias*, *Philebus* and *Republic*. . . . Since every thing that becomes on account of another, on account of a being, thus has its goal and purpose not in itself but outside of itself in a being, then pleasure as a thing that becomes cannot coincide with the concept of the good, since the latter has its purpose in itself. Further, he who finds happiness in pleasure would choose for himself a perpetual coming-to-be and passing-away, since coming into being is necessarily connected to passing away.

24. UNIVERSAL DEFINITION OF VIRTUE

By *aretē* (virtue) he understands the quality of a thing by which it becomes capable of fulfilling its purpose. Thus he speaks of

an *aretē* of the eyes, ears, and so on. Each thing has its own virtue. The virtue of a thing is (a) its genuine good: since the good of a thing is nothing alien to it, but that which belongs to its innermost essence, which from the very beginning has been peculiar to it. Virtue is further (b) its beauty: since something is beautiful through its appropriate being, through its measured, orderly essence. Virtue is (c) the true profit and advantage of each thing: since the concepts beautiful and good stand to the useful as cause stands to effect. Since finally everything which is natural is also pleasant and on the whole the pleasurable is only an aspect of the beautiful and good, thus there is in the virtue of a thing also (d) its pleasurable being. Thus the virtue, for example, of the body is its fitness, strength, beauty, health, feeling well.

Virtue in a narrower sense is virtue of the *soul*. It is that part of its being, appropriate to its essence, in which it is capable of fulfilling its task. Whence even punishment becomes something good, since as a therapy it restores the soul again to its natural condition. To do an injustice is worse than to suffer one not only ethically, but also naturally. Virtue is the true good of the soul; this proposition must be held onto even if all the external consequences of the act were excluded, even if it remained hidden from the gods, and men misunderstood it and it were thought of as its opposite. Thus vice is the greatest evil, even if it looks like the opposite.

The natural, purpose-fulfilling being of a thing we call its *aretē*. Therefore if we speak of the *aretē* of the soul, we can only mean its natural, purpose-fulfilling being. But does this mean that it is the *essence* of each thing, of its nature, to fulfill its purpose? Or does it mean that it is the *task* of each thing to fulfill its purpose? In the first case a contradiction between essence and purpose is unthinkable: each thing *must* fulfill its specific character, whose purpose it should realize. *Aretē* would

then be *essence*, and there would always be *aretē* since it would coincide with specific character. If *aretē* belonged to the *essence* of the soul, then *kakia* (badness) in it were impossible. Therefore the other alternative is meant: it is the *task* of each thing to fulfill its purpose. That means that Plato does not reason from specific character (that which makes all souls souls) but from the ideal character. The perfect soul, the Idea of the soul, is at the same time the true *essence* [*Wesen*], is *real* [*real*]. The *aretē* of a thing is just being in accord with this reality. Here, then, the theory of Ideas is at the basis; only Ideas have being and essence. From the true being all the other predicates (true, good, beautiful, useful) are drawn out. . . .

[25. HOW IS KAKIA OF THE SOUL POSSIBLE?; 26. THE FOUR CHIEF VIRTUES; 27. WISDOM (SOPHIA, PHRONĒSIS, NOUS); 28. ANDREIA (COURAGE); 29. SŌPHROSYNĒ (SELF-CONTROL); 30. DIKAIOSYNĒ (JUSTICE)]

31. LOWER GRADES OF VIRTUE

The presupposition of full, philosophical virtue is knowledge. But there is a lower grade. There are two guides for choosing the right way of life, knowledge and true opinion. The latter leads to the lesser virtue, the so-called political virtue. First (art of rule in Themistocles, Pericles, Aristides) a right touch and a gift of divination substitute for knowledge. In the *Laws* he sets up as the guardian of the state, alongside the knowing ones, also *tous di' alēthous doxēs iontas* (those who proceed via true opinion). Then there is the *dēmotikē aretē* (popular, or citizen, virtue) which consists in obedience to the laws, a matter of training and habituation: this virtue lacks reliability and certainty, for it is not teachable. It is by *theia moira* [*Meno* 100B, divine dispensation], not *epistēmē*. It is to be compared with soothsayers and poets, who also say many right things, without

knowing what they are saying. He challenges the Sophists' idea that their virtue is teachable: this is acquired only by training and habituation. Along with their lack of insight into the essence of virtue goes their failure to see its worth: they picture it as troublesome and arduous, its opposite as light and pleasant. Thus virtue is recommended on account of its this-worldly and other-worldly consequences; the Sophists seek a basis for their theory of virtue in egoistic motives (and proceed logically then to explain pleasure as virtue, the right of the stronger as the natural right of the free man). Citizen [*bürgerliche*] virtue is according to Plato as worthy as its basis, right opinion: "A mere shadow-picture (*skiagraphia*) of virtue." Such virtuous ones are like blind wanderers who by chance hit on the way. During the transmigration of their souls, they are put into a bee's or wasp's body or they revolve back to the class of the contented middle-class citizen (*Staatsbürger*). . . .

F. M. Cornford / Anamnesis

When Plato founded the Academy, shortly after his return from his first visit to Italy and Sicily (388–387B.C.), he already possessed something that might be called a system of philosophy, if the word 'system' did not carry the suggestion of a body of thought that has been rounded out and closed in a final form. Such a suggestion is false to the whole spirit of Platonism, which, to its author, always remained a philosophy in the proper sense, a pursuit of wisdom. Some of the adventures of this pursuit are recorded in the great dialogues of the middle period: the *Meno, Phaedo, Symposium, Republic* and *Phaedrus.* Taken as a whole, these dialogues set forth a theory

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of knowledge and of its objects which is recognized by the general judgment of ancient and modern scholars as characteristically Platonic. The *Meno*, which may be safely regarded as the earliest of the five works above-mentioned, is concerned with the way in which knowledge is acquired. This question is now linked with the immortal nature of the soul, the foundation stone of the new edifice. In the *Phaedo* attempts are made to prove that the soul not only will survive the death of the body, but has already existed before it became incarnate. At the same time, it is asserted that the Forms or 'Ideas,' which are the true objects of knowledge, are equally independent of the particular concrete things that embody them, or images of them, in the sensible world. The Theory of Forms is already expanding into a metaphysical theory of the nature of things, such as Aristotle tells us lay beyond the range of Socrates' speculation. In so far as it is possible to indicate a point where the thought of Socrates passes over into the far-reaching vision of the universe that we call Platonism, we have here reached that threshold.

We can, moreover, make out what it was that enabled Plato to advance so far beyond his master. There is, indeed, a sense in which the whole of Platonism is an expansion and completion of the Socratic doctrine, Goodness is knowledge. The theory of Ideas gives to this formula a more definite content by adding a clearer conception of the nature of knowledge and of its objects; it tells us also how this knowledge is gained. But this development does not arise solely from reflection on the Socratic formula. The new light comes from another source, already indicated in the *Gorgias*, namely the mathematical and religious philosophy of the Pythagoreans. The Platonic theory of Ideas is described by Aristotle as a variety of Pythagoreanism; its peculiar features being due to reflection on what was implied in Socrates' attempts to define moral terms. In his eyes Platonism was, in fact, rather Pythagoreanism modified by

Socratic influence than Socraticism modified by Pythagorean influence. This view of the historical perspective has an authority which cannot be shaken by anything less than a proof that it is inconsistent with the Platonic writings. In my opinion, no such proof has ever been produced.

Before turning to the new solution of the problem of knowledge presented in the *Meno*, it is well to remind ourselves that to a disciple of Socrates this problem meant, in the first place, the problem of that knowledge which Socrates had identified with goodness. The theory of Ideas is sometimes treated as if Plato had set out to discover a theoretical justification for what is now called 'science.' We must cling to the fact that in Plato's time no one of the imposing array of specialized natural sciences as now conceived and established—physics, chemistry, geology, botany and so on—had any existence. It cannot, therefore, have been the purpose of the theory of Ideas to provide them with a 'methodology.' We learn, moreover, from Aristotle that Plato in his youth had adopted the Heraclitean principle that all sensible things are in a perpetual flow of change, so that there can be no knowledge of them: and Aristotle adds that in later life he held fast to this opinion. Plato was not seeking a basis for any science of the sensible world; he was, in the first instance, seeking to give an account of that knowledge which must direct the conduct of human life. The objects he discovered were not laws of nature, if by that we mean formulas describing the sequence of sensible phenomena, or anything of that sort. The theory grew upon his hands into a doctrine of an intelligible 'nature of things,' consciously opposed to the materialism which identified reality with the elementary components of tangible bodies. But in its inception it was rather a theory of Ideals to regulate moral conduct. Socrates had been convinced that all men, if their minds could be cleared of the mists of prejudice and false beliefs, would see the true end of

life and could not then fail to desire it. But they cannot be just until they know what Justice is. The theory of Ideas asserts that Justice and other such ideals are eternal objects of thought which can be known and which possess universal and unconditional validity. They are not part of the furniture of your private world or of mine; nor are they arbitrary conventions of society. They form a common world independent of us all. They are, in fact, the absolute objects of the Socratic knowledge on which all virtue depends.

The *Meno* opens abruptly with an old question: how is goodness acquired? Is it innate, or formed as a habit by exercise, or can it be taught? Socrates observes that before we ask how goodness is to be acquired, we ought to know what it is. The definitions suggested by Meno fail to stand criticism; and he complains that Socrates is like the electric fish which benumbs its victims. At this point a dialogue of the earliest type would have ended in a confession of failure; but in the *Meno* this part is only prefatory. Plato goes on to raise the general question: how is it possible, in such an undertaking, to proceed further? From our failure to define the common character in a number of things called 'virtues,' it appears that we do not *know* the thing we are looking for. How, then, is it possible to look for it, and how can we ever tell whether we have found it or not? This problem had been crudely formulated, possibly by some sophist who criticized Socrates' search for definitions. It demands an answer.

It seemed quite clear to Plato that knowledge of the kind that Socrates sought, knowledge of the meaning of moral terms such as 'goodness' or 'virtue,' could never be accounted for by the apparatus of the empirical theory of knowledge. Goodness cannot be perceived by any sense, and a definition of it cannot be distilled out of accumulated impressions of colours, sounds, and so on, stored in the record of our personal experience. The

Meno, moreover, contains evidence of a newly awakened interest in mathematics, the only abstract science then existing which had developed a systematic logical procedure for the discovery of new truths. Whether independently or through contact with the mathematicians of Cyrene and Southern Italy, Plato came to recognize that mathematical objects are not the concrete things around us, but objects of thought known by the mind when, as the *Phaedo* says, it withdraws from the senses to think 'by itself.' Arithmetic and geometry consist of a system of truths which do not even hold good of the visible and tangible things of sense, and which cannot be proved by reference to such things. They belong to a supersensible world, accessible to our intelligence, but not to the organs of sight or touch or hearing.

This was not entirely a fresh discovery. Protagoras, who championed the world of appearance against the Eleatic denial of its reality, had written an attack on mathematics in which he argued that lines and figures such as geometry defines are not to be found in the actual world: a straight ruler does not touch a circular body only at one indivisible point.[1] We hear from Aristotle of some Pythagoreans who had drawn no distinction between mathematical solids and physical bodies, but argued as if geometrical demonstrations applied directly to natural objects. Protagoras' polemic was bound to bring home to the more philosophical mathematicians that they had all along been dealing with concepts, simpler than percepts and free from the imperfections of material things. Plato, at any rate, had clearly grasped that the numbers of arithmetic are not identical with collections of things, and that the lines, planes and solids of geometry are ideal objects to which material bodies can only approximate. He further saw that these mathematical objects

[1] Aristotle, *Met.* B 997b35.

have all the characters which make them knowable in a way that sensible things can never be known. They are perfect and exact, having neither more nor less content than is expressed in their definitions. They are exempt from time and change: nothing that is true about the sphere or the triangle can ever cease to be true at some other time because the object has changed in the interval. Finally, the knowledge we have of their properties can 'give an account' of itself; the properties are deduced by a rigid chain of reasoning, such that anyone who has understood the premisses must see the certainty of the conclusions. The name of knowledge cannot be refused to such a system of eternal objects and necessary truths.

Further, if these objects can be known, they must surely be real; for 'the perfectly real' must be identical with 'the perfectly knowable.'[2] The power of thought has broken through the surface of fleeting appearances and disclosed beyond it an objective 'nature of things' of a quite different order from the material elements or atoms of the physicists.

Now, if these real objects of thought are not to be found in the physical world and cannot be extracted from it, how do we come to know them? How is it that the geometer, shutting his eyes and thinking about objects he can never have seen or touched, can discover fresh truths he has not heard from any teacher? Whence does this knowledge come? Plato argued that it must come out of the mind itself; it is raised into consciousness by some process analogous to that whereby we recall some object we have formerly been acquainted with and have forgotten. This is the famous doctrine that 'learning,' the process of acquiring knowledge in the full sense, is Recollection (*Anamnesis*).

Socrates brings forward this doctrine as furnishing a pos-

[2] *Rep.* v, 477A.

sible solution of the problem raised by Meno: how can we look for something we do not know, and how can we tell when we have found it? Socrates has heard it from 'men and women who are wise in divine matters,' 'priests and priestesses who have been concerned to give an account of their proceedings.' It has also been stated by many inspired poets, including Pindar.

> They say that the soul of man is immortal; now it comes to that end which men call dying, and now it is born again, but it is never destroyed. We ought therefore, they say, so long as we live to keep ourselves as pure as we can.
>
> For as for those from whom Persephone exacts the penalty of the ancient woe, in the ninth year she gives up their souls again to the sunlight in this world above. From these come noble princes and men swift in strength and highest in wisdom; and for all time to come men call them pure heroes.[3]
>
> Since, then, the soul is immortal and has been born many times, since it has seen all things both in this world and in the other, there is nothing it has not learnt. No wonder, then, that it is able to recall to mind goodness and other things, for it knew them beforehand. For, as all reality is akin and the soul has learnt all things, there is nothing to prevent a man who has recalled—or, as people say, 'learnt'—only one thing from discovering all the rest for himself, if he will pursue the search with unwearying resolution. For on this showing all inquiry or learning is nothing but recollection.

In order to convince Meno that knowledge can be gained without teaching, Socrates conducts his experiment with one of Meno's slaves, who has never been taught geometry. By means of questioning he elicits from the slave the solution of a not very easy problem, the construction of a square which shall be double a given square. (This involves the theorem about the square on the hypotenuse, which the ancients ascribed to Py-

[3] Pindar, *Dirges, frag.* 133.

thagoras himself.) Socrates claims that he is not teaching or imparting information: he only asks questions. The slave is producing his own opinions. At first, his opinions are wrong; but, still by questions, he is led on to see his mistakes and to produce true opinions. It is possible, then, to possess, somewhere in one's mind, true opinions about things one does not know. If the slave were repeatedly put through the demonstration, these opinions would be converted into knowledge. This means that he would come to see clearly the necessary connexions of reason and consequence and to feel that complete certainty which no argument could shake. He would not merely believe the conclusion, as he now does; he would know it. By the same method, he might be made to produce knowledge of 'the whole of geometry and all the other mathematical sciences' (*μαθήματα*, 85E).

In conclusion, Socrates argues that the slave, not having learnt geometry in this life, must have acquired his knowledge before he was born, or indeed have possessed it always. 'And if the truth of things is at all times in the soul, the soul must be immortal.' Socrates adds, however, that he is not prepared to defend this theory at all points, though he is satisfied that we shall be the better for not allowing ourselves to be debarred by any objection from inquiring after things we do not know. Plato's dramatic method leaves us in uncertainty as to the extent of this reservation. It might mean no more than a warning to the reader not to suppose that the real Socrates had accepted the doctrine of immortality and reincarnation which he says he has heard. Or it might mean that Plato himself, though convinced of the soul's immortality and of its access, through pure thought, to the truth about reality, is not committed to the whole theological scheme of reincarnation and the myths associated with it.

That Plato himself was convinced of the pre-existence of the soul, its inherently immortal nature, and its power of recol-

lection, is clear from the *Phaedo*, where the theory of Recollection is reaffirmed and supported by fresh arguments. The experiment in the *Meno* is there alluded to, not by Socrates, but by the young Theban Kebes, who reminds his friend Simmias of 'one admirable argument, that when people are questioned, if the questions are well framed, they will give a true account of anything. They could not do so unless they had in them knowledge and a right account of the matter. If you confront them with geometrical diagrams and things of that sort, it becomes abundantly clear that this is so.' The words 'if the questions are well framed' may possibly point to some uneasiness in Plato's mind. The experiment conducted on the slave might be criticized on the ground that many of Socrates' questions are leading questions. At any rate, Plato now offers another proof, which dispenses with the intervention of a questioner, recollection being occasioned by acts of perception. The conclusion reached is that our knowledge of such a concept as absolute equality must have been obtained before birth. It cannot be derived from sense-perception because our senses never show us two perfectly equal things. The sight of approximately equal things revives the thought of perfect equality—an ideal standard which they seem to be striving after and of which we judge that they fall short. The weak point in the argument lies in the statement that we make such judgments, implying acquaintance with perfect equality, as soon as we begin to use our senses; whereas in truth such judgments are highly reflective and not made by infants. It seems quite clear, however, that Plato thought the argument valid. It provides the one substantial proof of pre-existence in the first part of the dialogue and it is accepted and reaffirmed by all parties to the discussion.

In the *Meno* the theory of *Anamnesis* was put forward to escape the sophistic dilemma: either we know a thing, and then there is no need to look for it; or we do not know it, and then

we cannot know what we are looking for. The dilemma assumed that the only choice is between complete knowledge and blank ignorance. *Anamnesis* provides for degrees of knowledge between these two extremes.

There is, in the first place, unconscious knowledge, which may be present in our minds without our being aware of it or ever having been aware of it since we were born. The contrast between latent knowledge and blank ignorance is familiar in common experience. We are often sure that we know a certain person's name, but cannot recall it. The information is somewhere 'at the back of our mind' and we know enough about it to reject suggestions felt to be incorrect. If we leave it alone, it appears to force its way into consciousness. All this, of course, is a matter of the ordinary memory of past experience. But there is some analogy with the effort of the *Meno* to grasp the meaning of the term 'virtue' or 'goodness.' We have never yet known the full meaning in this life, but the question 'What is virtue?' does mean something to us: if the word 'virtue' corresponded to a complete blank in our minds, we could not discuss the question or reject suggested definitions as inadequate. The state of mind is described by Laches where he says: 'I am really annoyed that I cannot express what I have in my mind. I seem to myself to have a notion of what courage is, but somehow it has escaped me just now, so that I cannot formulate it and say what it is.'[4] Our experience is somewhat similar when the mind is, as Plato says, 'pregnant' or 'in labour with' some thought which is pressing to birth. In this case what is striving to come to the surface is not some single item of past experience, such as a temporarily forgotten name registered somewhere in the ordinary memory. It is a more complex thought

[4] *Laches*, 194B: *ὡς ἀληθῶς ἀγανακτῶ εἰ οὑτωσὶ ἃ νοῶ μὴ οἷός τ' εἰμὶ εἰπεῖν. νοεῖν μὲν γὰρ ἔμοιγε δοκῶ περὶ ἀνδρείας ὅτι ἔστιν, οὐκ οἶδα δ' ὅπῃ με ἄρτι διέφυγεν, ὥστε μὴ συλλαβεῖν τῷ λόγῳ αὐτὴν καὶ εἰπεῖν ὅτι ἔστιν.* Cf. *Euthyphro*, 11B.

or idea which has never yet been present to consciousness. Socrates' method of asking questions, compared in the *Theaetetus* to the midwife's art, aims at raising such thoughts to the conscious level. It relieves the painful labour of the mind by bringing its own contents to birth; it does not put into the mind anything that was not already there.

Here is the difference between learning from a teacher and discovering truth for oneself, on the prompting of some external stimulus. The teacher 'hands over' information—transfers it from his mind to the learner's. But in Recollection, there is, as Socrates said, 'nothing to prevent a man who has recalled only one thing from discovering all the rest for himself, if he will pursue the search with unwearying resolution.'

Probably Plato had observed what happened in his own mind when he made a discovery. We cannot account for such an occurrence, if we confine ourselves to the bald dilemma: we must either know a thing or not know it—either be fully conscious of it or in a state of blank ignorance. We must take into account Plato's third factor, unconscious knowledge. A new theory or generalization appears to grow and take shape at the back of the mind. We have only enough inkling of it to guide attention to the right quarter. The embryo theory seems to gather force in the submerged region and to strive for expression. In the moment of discovery, it breaks into full consciousness with an effect of sudden illumination, overwhelmingly convincing and self-evident.

In a letter of 1841, Robert Mayer described his discovery of the conservation of energy. Mayer was not a physicist, but a doctor; he was on a voyage, working at physiology. He writes:

> If one wishes to be enlightened about physiological matters, some knowledge of physical processes is indispensable, unless one prefers to work from the metaphysical side, which is immensely distasteful to me. I therefore kept to physics, clinging

> to the subject with such ardour that, although it may seem ridiculous to say so, I cared little about what part of the world we were in. I preferred to remain aboard where I could work uninterruptedly, and where many an hour gave me such a feeling of being inspired in a way I can never remember having experienced either before or since. A few flashes of thought that thrilled through me were immediately diligently pursued, leading again in their turn to new subjects. Those times are passed, but subsequent quiet examination of what then emerged, has taught one that it was a truth which can not only be subjectively felt, but also proved objectively; whether this could be done by one who has so little knowledge of physics as I have, is a matter which obviously I must leave undecided.

Heim, in his book on Energetics, expresses the opinion:

> that Robert Mayer's new thought did not gradually detach itself, by dint of revolving it in his mind, from the conceptions of power transmitted from the past, but belongs to those ideas that are intuitively conceived, which, originating in other spheres of a mental kind, surprise thought, as it were, compelling it to transform its inherited notions conformably with those ideas.[5]

These quotations illustrate a kind of experience that Plato must certainly have had; there must, indeed, have been some moment when the theory of Ideas itself flashed upon his mind and illuminated the problem of a knowledge independent of sensible experience. The pieces of the puzzle suddenly fitted together: what was implied in Socrates' attempts to define universal terms, and the a priori discovery of geometrical truth. All this could be explained if mathematical and moral concepts are eternal objects of thought, to be known without the intervention of the senses; and if the knowledge of them is not dis-

[5] These quotations are borrowed from C. G. Jung, *Analytical Psychology*, trans. C. E. Long (London, 1920), p. 411.

tilled or extracted from the changing things of sense, but recovered out of a memory always latent in the soul.

So far, we have been able to illustrate the doctrine of *Anamnesis* from experiences universally recognized, but capable of explanations which do not involve the acquisition of knowledge before birth, without the use of the senses. We must next consider the features of the doctrine which go beyond what would now be commonly admitted.

Obviously it is only knowledge of a certain kind that can be thus recovered. Historical knowledge in the widest sense—the facts and events of human or natural history—is not contained in the inner consciousness. We are not born with the knowledge that the battle of Marathon was fought in 490 B.C., or that fire burns if we touch it. Such facts are learnt by sensible experience, or taught by various sources of information; and they are registered in the ordinary personal memory. To these records Plato refuses the name of knowledge. They constitute what, in common with the empiricists, he calls 'experience which merely preserves a memory of what usually happens,' in contrast with 'art' which understands the nature of its object and the reasons for its procedure.[6]

It is clear that in Plato's middle period his attention was concentrated on mathematical truth and those moral ideals the knowledge of which, as sought by Socrates, was to regulate conduct. The essential feature of these objects, that which makes them in the full sense knowable, is their eternal and unchanging nature. They are outside and beyond the flow of time and becoming in which everything the senses can perceive is involved. All previous philosophy had been the search for some permanent and unchanging 'nature of things'; but the physicists had imagined that this was to be found in some ulti-

[6] *Gorg.* 501A: *τριβῇ καὶ ἐμπειρίᾳ μνήμην μόνον σῳζομένη τοῦ εἰωθότος γίγνεσθαι.*

mate form of matter. Plato, having accepted Heraclitus' intuition that nothing in the sensible world is exempt from change, but every form of matter is perpetually dying and being reborn in a different form, could only declare that the permanent reality was immaterial and accessible only to pure thought. In the objects of mathematics and in the moral forms he recognized realities having these necessary attributes. Knowledge, accordingly, was limited to our apprehension of them.

All this means, of course, that the memory containing this knowledge is not the personal or individual memory, the waxen tablet of the empiricist, which registers sense-impressions that have flowed in upon us since birth and all the information we have 'learnt' in the ordinary sense. The memory implied in the doctrine of *Anamnesis* is an impersonal memory. Its contents are the same in all human beings. Any two persons who have clearly conceived the definition of the triangle and proceed to reflect upon it will be led to discover exactly the same truths about it, or, if they differ, the one can convince the other of his mistake. The only difference between individuals will lie in the extent to which the latent knowledge has been recovered. According to the *Meno*, the whole of knowledge can be recovered in this way. 'All reality is akin': the structure of truth forms a single coherent system, in which the parts are linked together by logical necessity. The recovery of a single link is enough to lead the mind on to further truths without limit.

It has long been recognized that the close connexion of *Anamnesis* with reincarnation and with mathematics points to Pythagorean sources. Where the belief in reincarnation exists, it is held that the soul must have forgotten its previous lives and its experiences in the other world, as the souls in the myth of Er drink of the River of Unmindfulness before returning to be born again. But some souls drink more of the water, some

less. This means that the less forgetful spirits can recover during this life some part of the forgotten knowledge. In popular belief, in present-day Burma for example, the Buddhist quite commonly remembers enough of his previous life to identify the dead person whose soul has passed into his own body. The belief in this form appears in the legend of Pythagoras. Empedocles[7] describes him as 'a man of surpassing knowledge, who had won the utmost wealth and wisdom and was well skilled in all manner of works; for whenever he reached out with all his mind, he easily saw everything that is, in ten, yea, twenty lifetimes of men.' The last words here may refer to the tradition that Pythagoras, like the Buddhist, could recall his previous incarnations.[8] But the passage as a whole suggests much more than this—not a mere recollection of past experiences in this world, but the 'utmost wealth of wisdom,' a vision of 'everything that is,' gained in a state of exaltation when the powers of the mind were stretched to their furthest extent. Empedocles' description is, in fact, compatible with Socrates' view of the range of recoverable knowledge in the *Meno;* and it is at least possible that Pythagoras himself regarded the mathematical discoveries that came to him in moments of intensely concentrated thought as revelations 'seen' when his spirit had thrown off the trammels of the flesh and visited the unseen world. This possibility will appear more probable in the light of our later argument. But we cannot tell how far the doctrine of the *Meno* goes beyond Pythagorean tradition as known to Plato.[9]

The point in which Plato unquestionably agrees with the Pythagoreans is the belief that the human soul is an indepen-

[7] Empedocles, B 129 (*Vors.*[5] I, p. 364). Rohde, Diels, Delatte, Burnet and others agree that the reference is to Pythagoras.

[8] See Heracleides Ponticus *ap.* D.L. VIII, 4 (*Vors.*[5] I, p. 100).

[9] This question has been discussed by A. Cameron, *The Pythagorean Background of the Theory of Recollection* (Wisconsin, 1938).

dent substance which has existed before it entered its present bodily habitation and will exist again apart from the body after death. It is, moreover, not merely indestructible but conscious and intelligent, in possession of knowledge which it has not obtained through the bodily senses. The purpose of the *Phaedo* is to recommend this belief in a separate intelligence (νοῦς χωριστός) concurrently with the equally unfamiliar belief that the objects known by this intelligence are Forms separate from material things (χωριστὰ εἴδη). The protreptic discourse of Socrates, which precedes the argumentative portion of the *Phaedo*, opens with a definition of death which prejudges the question of survival. Death is defined as 'the deliverance of the soul from the body': 'to be dead' means that 'the body has come to be by itself in separation from the soul, and the soul by itself in separation from the body' (64c). In accordance with the religious doctrine to which Socrates has already appealed, the animal pleasures are condemned as chaining the soul to its material associate. The senses—even sight and hearing—are no better than a hindrance to thought. The soul that is in love with wisdom takes flight from all fellowship with the body. Its one desire is to gather itself together out of the body and withdraw by itself to contemplate realities the senses cannot reveal. This is that 'purification,' followed by the vision of truth, which the mysteries enjoin. In this world, at the best, the withdrawal can be but imperfectly achieved. Bodily death will be the final and complete deliverance.

Thus the conversation in the *Phaedo* opens, not with argument, but with a passage of religious eloquence upon the meaning of life and death, in which the author's conviction has plainly carried him beyond the domain of rational proof. Doubts are raised later, and arguments devised to counter them. Recollection is again offered as a proof of pre-existence: the soul which can exist apart from the body is the element

in us which thinks and knows the Forms which exist apart from material things.

It is only when this conception of the rational soul and the objects of its thought has been clearly brought before the reader's mind, that one of the young Thebans puts forward the materialistic view of the soul or vital principle as a mere 'harmony' or 'adjustment' of the physical opposites comprising the body. Such a soul could not exist independently; but pre-existence has by this time been established by the proof of Recollection, which is bound up with the existence of the Forms (92D). And about the existence of the Forms Plato has no serious doubts.

The harmony doctrine is closely related to the medical theory of health as the balance or due proportion of opposite 'powers' in the body; indeed it seems to identify the soul with the healthy condition of the living body, disease being an upsetting of the balance, which, if it goes beyond a certain point, will entail the dissolution of the bodily elements in death. Plato's doctrine of the separately existing intelligence is sharply opposed to this, just as, on the side of the objects of intelligence, his separate and eternally existing Forms are contrasted with the images which, according to the empirical epistemology, flow into our senses from material bodies. The medical-empirical apparatus of materialism seemed to Plato utterly inadequate to account for the knowledge which we certainly obtain in mathematical discovery, as well as for the knowledge of absolute moral standards on which 'virtue,' in the full Socratic sense, depends.

To return now to the *Meno*. As we remarked earlier, the dilemma which was to be solved by *Anamnesis* assumed that there were no degrees of knowledge intermediate between complete knowledge and blank ignorance. The experiment with the slave showed that this was not so: his mind contained beliefs

which he had never been taught and which could be awakened by questioning. Some of these beliefs were true, some false. Even the true ones could not be called knowledge until the slave should have been taken through the demonstration many times and come to see the necessary connexions. He would then not merely be thinking correctly; he would know with unshakable certainty (85c). Towards the end, Socrates returns to this point. A true belief may be as useful a guide to action as knowledge: a man who is correctly informed about the road to Larissa will get there as well as one who knows the road by having travelled over it himself. But his belief will be insecure; a second informant might persuade him that he had been misdirected. True belief is converted into knowledge by 'reflection on the reason,' binding a whole set of true beliefs into a coherent system. And this work of reflection, says Socrates, 'is recollection, as we agreed earlier' (98A). The reference is to the passage where all reality was said to be 'akin,' so that, when the mind has picked up a single link in the chain, there is nothing to prevent it from discovering all the rest for itself. This history of mathematical discoveries would illustrate how isolated theorems, such as the Pythagorean proposition itself, had been divined by acts of intuition, but the task of proving them had forced mathematicians to follow the chains of reasoning back, through more 'elementary' propositions, to the original definitions and axioms. It thus appears that *Anamnesis* is a long, if not an endless, process. Starting from the awakening of a single correct belief or (to look at it in another way) a single act of intuition, the work of reflection or reasoning (λογισμός) may continue indefinitely until, if that were possible, the whole logical structure of truth should have been recovered.

Nothing short of the goal could be called knowledge in the fullest sense. As the *Republic* points out, even the entire structure of geometry depends on premisses which may have been

unwarrantably assumed to be self-evident and ought really to be guaranteed by deduction from the highest of all principles. Plato is now coming to conceive the knowledge which is true virtue as involving nothing less than an insight into the whole structure of reality, to be reached by arduous training in mathematics and moral philosophy, leading to a vision of the ultimate Form which irradiates the universe with the light of truth.

At the end of the *Meno* Socrates returns to the question: can virtue be taught? The theory of *Anamnesis* had given a totally new meaning to 'teaching' and 'learning,' but we are left to think out the consequences for ourselves. They come to this. (1) All knowledge worthy of the name is recovered out of our own minds. No 'teaching' in the usual sense is needed: the midwife's art of Socrates will bring latent thoughts to birth, and his elenchus will clear away the false ones. The knowledge on which true philosophic virtue depends will be gained by this process; but it cannot be 'taught' in the ordinary sense.[10] (2) Ordinary teaching and learning mean the 'handing over' of information from one person to another (93B). A system of morality laid down by philosophers on the strength of their own knowledge could be taught to the citizens of a state under their control. This would never be more than 'true belief'; but it would be a sufficient guide for action, and would amount to the lower or 'popular' kind of virtue.

[10] The ostensible conclusion of the *Meno* (98DE) disguises this result, by resuming the argument that virtue cannot be knowledge, because, if it were, it must be 'teachable' (διδακτόν), and there are in fact no teachers of it (i.e., the Sophists who profess to teach virtue cannot do so). This argument deliberately ignored the distinction between 'teachable' (διδακτόν) and 'recoverable by recollection' (ἀναμνηστόν) which Socrates had just established (87BC). The fact that the Sophists cannot 'teach' virtue does not prove that virtue is not knowledge of the sort that is recollected under Socratic questioning. As in other early dialogues the true conclusion is masked.

Finally comes the suggestion that comparatively good statesmen are guided, not by knowledge or wisdom (φρόνησις), but by a sort of inspiration, like that of the seer and the poet, who 'in their rapt condition say many true things, but do not *know* what they mean.' They have not intelligence (νοῦς), but are 'possessed by divine inspiration.' This suggestion is not explicitly connected with *Anamnesis*, but it is based on the same analysis. The inspired statesman is acting on one of those true beliefs or intuitions which arise in our minds but have not been co-ordinated and justified by 'reflection on the reason.' The interesting point is the comparison of such intuitions to the inspiration of the poet and the seer. The further consideration of this comparison in the next chapter* will lead to the conclusion that the Theory of Recollection represents a view of the sources of knowledge much older than the medical-empirical doctrine that knowledge comes through the senses.

* [*Editor's note:* Chapter 5 of *Principium Sapientiae*, "Seer, Poet, Philosopher."]

Karl Popper / The nature of philosophical problems and their roots in science

I

It was after some hesitation that I decided to take as my point of departure the present position of English philosophy. For I believe that the function of a scientist or of a philosopher is to solve scientific or philosophical problems, rather than to talk about what he or other philosophers are doing or might do. Any unsuccessful attempt to solve a scientific or philosophical problem, if it is an honest and devoted attempt, appears to me more

The Chairman's address, delivered at the meeting of 28th April 1952, to the Philosophy of Science Group of the British Society for the History of Science (now the British Society for the Philosophy of Science); first published in THE BRITISH JOURNAL FOR THE PHILOSOPHY OF SCIENCE, *3, 1952. Reprinted from* CONJECTURES AND REFUTATIONS, *2nd edition, 1965, where it appeared as Chapter 2, by permission of the author and Routledge and Kegan Paul and Basic Books.*

significant than a discussion of such a question as 'What is science?' or 'What is philosophy?' And even if we put this latter question, as we should, in the slightly better form, 'What is the character of philosophical problems?', I for one should not bother much about it; I should feel that it had little weight, even compared with such a minor problem of philosophy as the question whether every discussion or every criticism must always proceed from 'assumptions' or 'suppositions' which themselves are beyond argument.[1]

When describing 'What is the character of philosophical problems?' as a slightly better form of 'What is philosophy?' I wished to hint at one of the reasons for the futility of the current controversy concerning the nature of philosophy: the naïve belief that there is an entity such as 'philosophy,' or perhaps 'philosophical activity,' and that it has a certain character or essence or 'nature.' The belief that there is such a thing as physics, or biology, or archaeology, and that these 'studies' or 'disciplines' are distinguishable by the subject matter which they investigate, appears to me to be a residue from the time when one believed that a theory had to proceed from a definition of its own subject matter.[2] But subject matter, or kinds of things, do not, I hold, constitute a basis for distinguishing disciplines. Disciplines are distinguished partly for historical reasons and reasons of administrative convenience (such as the organization of teaching and of appointments), and partly because the theories which we construct to solve our problems

[1] I call this a minor problem because I believe that it can easily be solved, by refuting the ('relativistic') doctrine which gives rise to the question. (Thus the answer to the question is negative. See the Addendum to vol. II of my *Open Society*, added to the fourth edition of 1962.)

[2] This view is part of what I have called 'essentialism.' Cf. for example my *Open Society*, chaps. 2 and 11, or *The Poverty of Historicism*, section 10.

have a tendency[3] to grow into unified systems. But all this classification and distinction is a comparatively unimportant and superficial affair. *We are not students of some subject matter but students of problems.* And problems may cut right across the borders of any subject matter or discipline.

Obvious as this fact may appear to some people, it is so important for our present discussion that it is worth while illustrating it by an example. I need hardly mention that a geologist's problem such as assessing the chances of finding deposits of oil or uranium in a certain district has to be solved with the help of theories and techniques usually classified as mathematical, physical and chemical. It is however less obvious that even a more 'basic' science such as atomic physics may have to make use of a geological survey, and of geological theories and techniques, to solve a problem in one of its most abstract and fundamental theories; for example the problem of testing predictions about the relative stability or instability of atoms of an even or odd atomic number.

I am quite ready to admit that many problems, even if their solution involves the most diverse disciplines, nevertheless 'belong' in some sense to one or another of the traditional disciplines; the two problems just mentioned clearly 'belong' to geology and physics respectively. This is because each of them arises out of a discussion characteristic of the tradition of the discipline in question. It arises out of the discussion of some theory, or out of empirical tests bearing upon a theory; and theories, as opposed to subject matter, may constitute a discipline (which might be described as a somewhat loose cluster

[3] This tendency can be explained by the principle that theoretical explanations are the more satisfactory the better they can be supported by *independent* evidence. For in order to be supported by mutually independent pieces of evidence, a theory must be sweeping.

of theories undergoing challenge, change, and growth). But this does not affect my point that the classification into disciplines is comparatively unimportant, and that we are students not of disciplines but of *problems*.

But are there philosophical problems? The present position of English philosophy—my point of departure—originates, I believe, in the late Professor Ludwig Wittgenstein's doctrine that there are none; that all genuine problems are scientific problems; that the alleged problems of philosophy are pseudo-problems; that the alleged propositions or theories of philosophy are pseudo-propositions or pseudo-theories; that they are not false (if they were false, their negations would be true propositions or theories) but strictly meaningless combinations of words,[4] no more meaningful than the incoherent babbling of a child who has not yet learned to speak properly.[5]

As a consequence, philosophy cannot contain any theories. Its true nature, according to Wittgenstein, is not that of a theory, but that of an activity. The task of all genuine philosophy is to unmask philosophical nonsense, and to teach people to talk sense.

[4] 'All animals are equal but some are more equal than others' is an excellent example of an expression which would be 'meaningless' in the technical sense of Russell and Wittgenstein, though clearly far from meaningless (in the sense of pointless) in the context of Orwell's *Animal Farm*. It is interesting that later Orwell considered the possibility of introducing a language, and enforcing its use, in which 'All men are equal' would become meaningless in Wittgenstein's technical sense.

[5] Since Wittgenstein described his own *Tractatus* as meaningless (see also the next footnote) he distinguished, at least by implication, between revealing or important and worthless or unimportant nonsense. But this does not affect his main doctrine which I am discussing, the non-existence of philosophical problems. (A discussion of other doctrines of Wittgenstein's can be found in the Notes to my *Open Society*, especially notes 26, 46, 51, and 52 to chap. 11.)

My plan is to take this doctrine[6] of Wittgenstein's as my starting point. I shall try to explain it (in section II); to defend it, to some extent; and to criticize it (in section III). And I shall illustrate all this (in sections IV to XI) by some examples from the history of scientific ideas.

But before proceeding to carry out this plan I wish to reaffirm my conviction that a philosopher should philosophize: he should try to solve philosophical problems, rather than talk about philosophy. If Wittgenstein's doctrine is true, then nobody can philosophize, in my sense. Were this my opinion I would give up philosophy. But it so happens that I am not only deeply interested in certain philosophical problems (I do not much care whether they are 'rightly' called 'philosophical problems'), but possessed by the hope that I may contribute—if only a little, and only by hard work—to their solution. My only excuse for talking here about philosophy—instead of philosophizing—is my hope that in carrying out my programme

[6] It is easy to detect at once one flaw in this doctrine: the doctrine, it may be said, is itself a philosophic theory, claiming to be true, and not to be meaningless. This criticism, however, is perhaps a little cheap. It might be countered in at least two ways. (1) One might say that the doctrine is indeed meaningless *qua* doctrine, but not *qua* activity. (This is the view of Wittgenstein, who said at the end of his *Tractatus Logico-Philosophicus* that whoever understood the book must realize at the end that it was itself meaningless, and must discard it like a ladder, after having used it to reach the desired height.) (2) One might say that the doctrine is not a philosophical but an empirical one; that it states the historical fact that all apparent 'theories' proposed by philosophers are in fact ungrammatical; that these do not, in fact, conform to the rules inherent in those languages in which they appear to be formulated; that it turns out to be impossible to remedy this defect; and that every attempt to express them properly has led to the loss of their philosophic character (and revealed them as, for example, empirical truisms, or as false statements). These two counter arguments do, I believe, rescue the threatened consistency of the doctrine, which in this way indeed becomes 'unassailable'—to use Wittgenstein's term—by the kind of criticism referred to in this note. (See also the next note but one.)

for this address an opportunity may turn up to do a little philosophizing after all.

II

Ever since the rise of Hegelianism there has existed a dangerous gulf between science and philosophy. Philosophers were accused—rightly, I believe—of 'philosophizing without knowledge of fact,' and their philosophies were described as 'mere fancies, even imbecile fancies.'[7] Although Hegelianism was the leading influence in England and on the Continent, opposition to it, and contempt of its pretentiousness, never died out completely. Its downfall was brought about by a philosopher who like Leibniz, Berkeley, and Kant before him had a sound knowledge of science, and especially of mathematics. I am speaking of Bertrand Russell.

Russell is also the author of the classification, closely related to his famous *theory of types*, which is the basis of Wittgenstein's view of philosophy: the classification (criticized in my *Conjectures and Refutations*, 2nd ed., p. 309) of the expressions of a language into

(1) *True statements*

(2) *False statements*

(3) *Meaningless expressions*, among which there are statement-like sequences of words, the so-called 'pseudo-statements.'

Russell used this distinction to solve the problem of the logical paradoxes which he discovered. For his solution it was

[7] The two quotations are not the words of a scientific critic but, ironically enough, Hegel's own characterization of the Natural Philosophy of his forerunner and one-time friend Schelling. Cf. my *Open Society*, note 4 (and text) to chap. 12.

essential to distinguish more especially between (2) and (3). We might say, in ordinary speech, that a false statement like, '3 times 4 equals 173,' or, 'All cats are cows,' is meaningless. Russell, however, reserved the term 'meaningless' for expressions such as, '3 times 4 are cows,' or, 'All cats equal 173,' that is for expressions of a sort which it is better not to describe as false statements. They are better not described as false because the negation of a meaningful but false statement will always be true. But the *prima facie* negation of the pseudo-statement, 'All cats equal 173,' is, 'Some cats do not equal 173,' and this is just as unsatisfactory a pseudo-statement as the original statement. *Negations of pseudo-statements are again pseudo-statements*, just as negations of proper statements (true or false) are proper statements (false or true, respectively).

This distinction allowed Russell to eliminate the paradoxes (which, he said, were meaningless pseudo-statements). Wittgenstein went further. Led perhaps by the feeling that what philosophers, especially Hegelian philosophers, were saying was somewhat similar to the paradoxes of logic, he used Russell's distinction in order to denounce *all philosophy* as strictly *meaningless*.

As a result there could be no genuine philosophical problems. All alleged philosophical problems could be classified under four heads:[8] (1) those which are purely logical or mathe-

[8] Wittgenstein still upheld the doctrine of the non-existence of philosophical problems in the form here described when I saw him last (in 1946, when he presided over a stormy meeting of the Moral Sciences Club in Cambridge, on the occasion of my reading a paper on 'Are there Philosophical Problems?'). Since I had never seen any of his unpublished manuscripts which were privately circulated by some of his pupils I had been wondering whether he had modified what I here call his 'doctrine'; but on this, the most fundamental and influential part of his teaching, I found his views unchanged.

matical, to be answered by logical or mathematical propositions, and therefore not philosophical; (2) those which are factual, to be answered by some statement belonging to empirical science, and therefore again not philosophical; (3) those which are combinations of (1) and (2), and therefore again not philosophical; and (4) meaningless pseudo-problems such as, 'Do all cats equal 173?' or, 'Is Socrates identical?' or, 'Does an invisible, untouchable, and apparently altogether unknowable Socrates exist?'.

Wittgenstein's idea of eradicating philosophy (and theology) with the help of an adaptation of Russell's theory of types was ingenious and original (and more radical even than Comte's positivism, which it resembles closely).[9] This idea became the inspiration of a powerful modern school of language analysts who have inherited his belief that there are no genuine philosophical problems, and that all a philosopher can do is to unmask and dissolve the linguistic puzzles which have been proposed by traditional philosophy.

My own view of the matter is that only as long as I have genuine philosophical problems to solve shall I continue to take an interest in philosophy. I fail to understand the attraction of a philosophy without problems. I know, of course, that many people talk nonsense; and it is conceivable that it should become one's task (an unpleasant one) to unmask somebody's nonsense, for it may be dangerous nonsense. But I believe that some people have said things which were not very good sense, and certainly not very good grammar, but which were all the same highly interesting and exciting, and perhaps more worth listening to than the good sense of others. I may mention the differential and integral calculus which, especially in its early forms, was no doubt completely paradoxical and nonsensical

[9] Cf. note 51 (2) to chap. 11 of my *Open Society*.

by Wittgenstein's (and other) standards; which became, however, reasonably well founded as the result of some hundred years of great mathematical efforts; but whose foundations even at this very moment are still in need, and in the process, of clarification.[10] We might remember in this context that it was the contrast between the apparent absolute precision of mathematics and the vagueness and imprecision of philosophical language which deeply impressed the earlier followers of Wittgenstein. But had there been a Wittgenstein to use his weapons against the pioneers of the calculus, and had he succeeded in eliminating their nonsense where their contemporary critics (such as Berkeley, who was fundamentally right) failed, he would have strangled one of the most fascinating and philosophically important developments in the history of thought. Wittgenstein once wrote: 'Whereof one cannot speak, thereof one must be silent.' It was, if I remember rightly, Erwin Schrödinger who replied: 'But it is only here that speaking becomes worth while.'[10a] The history of the calculus—and perhaps of Schrödinger's own theory[11]—bears him out.

No doubt we should all train ourselves to speak as clearly, as precisely, as simply, and as directly, as we can. Yet I believe that there is not a classic of science, or of mathematics, or in-

[10] I am alluding to G. Kreisel's recent construction (*Journal of Symbolic Logic*, 17 [1952], 57) of a monotone bounded sequence of rationals every term of which can be actually computed, but which does not possess a computable limit—in contradiction to what appears to be the *prima facie* interpretation of the classical theorem of Bolzano and Weierstrass, but in agreement, it seems, with Brouwer's doubts about this theorem.

[10a] After this paper was first published Schrödinger told me that he could not remember saying this, and that he did not believe that he ever said it; but he liked the remark. (Added 1964: I have found since that its real author was my old friend Franz Urbach.)

[11] Before Max Born proposed his famous probability interpretation, Schrödinger's wave equation was, some might contend, meaningless. (This is not, however, my opinion.)

deed a book worth reading that could not be shown, by a skilful application of the technique of language analysis, to contain many meaningless pseudo-propositions and what some people might call 'tautologies.'

Moreover, I believe that even Wittgenstein's original adaptation of Russell's theory rests upon a logical mistake. From the point of view of modern logic there no longer appears to be any justification for speaking of pseudo-statements or type mistakes or category-mistakes within ordinary, naturally grown languages (as opposed to artificial calculi) so long as the conventional rules of custom and grammar are observed. One may even say that the positivist who tells us with the air of the initiated that we are using meaningless words, or that we are talking nonsense, literally does not know what he is talking about—he simply repeats what he has heard from others who also did not know. But this raises a technical question which I cannot deal with here. (It is dealt with, however, in my *Conjectures and Refutations*, chapters 11 to 14.)

III

I have promised to say something in defence of Wittgenstein's views. What I wish to say is, first, that there is much philosophical writing (especially in the Hegelian school) which may justly be criticized as meaningless verbiage; secondly, that this kind of irresponsible writing was checked, for a time at least, by the influence of Wittgenstein and the language analysts (although it is likely that the most wholesome influence in this respect was the example of Russell who, by the incomparable charm and clarity of his writings, established the fact that subtlety of content is compatible with lucidity and unpretentiousness of style).

But I am prepared to admit more. In partial defence of Wittgenstein's views, I am prepared to defend the following two theses.

My first thesis is that every philosophy, and especially every philosophical 'school,' is liable to degenerate in such a way that its problems become practically indistinguishable from pseudo-problems, and its cant, accordingly, practically indistinguishable from meaningless babble. This, I shall try to show, is a consequence of philosophical inbreeding. The degeneration of philosophical schools in its turn is the consequence of the mistaken belief that one can philosophize without having been compelled to philosophize *by problems which arise outside philosophy*—in mathematics, for example, or in cosmology, or in politics, or in religion, or in social life. In other words my first thesis is this. *Genuine philosophical problems are always rooted in urgent problems outside philosophy, and they die if these roots decay.* In their efforts to solve them philosophers are liable to pursue what looks like a philosophical method or technique or an unfailing key to philosophical success.[12] But no such methods or techniques exist; in philosophy methods are unimportant; *any* method is legitimate if it leads to results capable of being rationally discussed. What matters is not methods or techniques but a sensitivity to prob-

[12] It is very interesting that the imitators were always inclined to believe that the 'master' did his work with the help of a secret method or a trick. It is reported that in J. S. Bach's days some musicians believed that he possessed a secret formula for the construction of fugue themes.

It is also interesting to note that all the philosophies which have become fashionable (so far as I am aware) have offered their disciples a kind of method for producing philosophical results. This is true of Hegelian essentialism which teaches its adherents to produce essays on the essence or nature or idea of everything—the soul, the universe, or the University; it is true of Husserl's phenomenology; of existentialism; and also of language analysis.

lems, and a consuming passion for them; or, as the Greeks said, the gift of wonder.

There are those who feel the urge to solve a problem, those for whom a problem becomes real, like a disorder which they have to get out of their system.[13] They may make a contribution even if they bind themselves to a particular method or a technique. But there are others who do not feel this urge, who have no serious and pressing problem but who nevertheless produce exercises in fashionable methods, and for whom philosophy is *application* (or whatever insight or technique you like) rather than *search*. They are luring philosophy into the bog of pseudo-problems and verbal puzzles; either by offering us pseudo-problems for real ones (the danger which Wittgenstein saw), or by persuading us to concentrate upon the endless and pointless task of unmasking what they rightly or wrongly take for pseudo-problems or 'puzzles' (the trap into which Wittgenstein fell).

My second thesis is that what appears to be the *prima facie* method of teaching philosophy is liable to produce a philosophy which answers Wittgenstein's description. What I mean by '*prima facie* method of teaching philosophy,' and what would seem to be the only method, is that of giving the beginner (whom we take to be unaware of the history of mathematical, cosmological, and other ideas of science as well as of politics) the works of the great philosophers to read; the works, say, of Plato and Aristotle, Descartes and Leibniz, Locke, Berkeley, Hume, Kant and Mill. What is the effect of such a course of reading? A new world of astonishingly subtle and vast *abstractions* opens itself before the reader; abstrac-

[13] I am alluding to a remark by Professor Gilbert Ryle, who says on page 9 of his *Concept of Mind:* 'Primarily I am trying to get some disorders out of my own system.'

tions on an extremely high and difficult level. Thoughts and arguments are put before his mind which sometimes are not only hard to understand, but which seem to him irrelevant because he cannot find out what they may be relevant to. Yet the student knows that these are the great philosophers, that this is the way of philosophy. Thus he will make an effort to adjust his mind to what he believes (mistakenly, as we shall see) to be their way of thinking. He will attempt to speak their queer language, to match the tortuous spirals of their argumentation, and perhaps even tie himself up in their curious knots. Some may learn these tricks in a superficial way, others may begin to become genuinely fascinated addicts. Yet I feel that we ought to respect the man who having made his effort comes ultimately to what may be described as Wittgenstein's conclusion: 'I have learned the jargon as well as anybody. It is very clever and captivating. In fact, it is dangerously captivating; for the simple truth about the matter is that it is much ado about nothing—just a lot of nonsense.'

Now I believe such a conclusion to be grossly mistaken; yet it is the almost inescapable outcome, I contend, of the *prima facie* method of teaching philosophy here described. (I do not deny, of course, that some particularly gifted students may find very much more in the works of the great philosophers than this story indicates—and without self-deception.) For the student's chance of discovering the extra-philosophical problems (mathematical, scientific, moral, and political problems) which inspired these great philosophers is very small indeed. As a rule, these problems can be discovered only by studying the history of, for example, scientific ideas, and especially the problem-situation in mathematics and the sciences during the period in question; and this in turn presupposes a considerable acquaintance with mathematics and science. Only if he under-

stands the contemporary problem-situation in the sciences can the student of the great philosophers understand that they tried to solve urgent and concrete problems; problems which they found could not be dismissed. And only after understanding this can the student attain a different picture of the great philosophies—one which makes sense of the apparent nonsense.

I shall try to establish my two theses with the help of examples; but before turning to these examples, I wish to summarize my theses, and to balance my account with Wittgenstein.

My two theses amount to the contention that as philosophy is deeply rooted in non-philosophical problems, Wittgenstein's negative judgment is correct, by and large, so far as philosophies are concerned which have forgotten their extra-philosophical roots; and that these roots are easily forgotten by philosophers who 'study' philosophy, instead of being forced into philosophy by the pressure of non-philosophical problems.

My view of Wittgenstein's doctrine may be summed up as follows. It is perhaps true, by and large, that *'pure'* philosophical problems do not exist; for indeed the purer a philosophical problem becomes the more is lost of its original significance, and the more liable is its discussion to degenerate into empty verbalism. On the other hand there exist not only genuine scientific problems, but genuine philosophical problems. Even if, upon analysis these problems turn out to have factual components, they need not be classified as belonging to science. And even if they should be soluble by, say, purely logical means they need not be classified as purely logical or tautological. Analogous situations arise in physics. For example, the problem of explaining certain spectral terms (with the help of a hypothesis concerning the structure of atoms) may turn out to be soluble by purely mathematical calculations. But this again does not imply that the problem belonged to pure mathe-

matics rather than to physics. We are perfectly justified in calling a problem 'physical' if it is connected with problems and theories which have been traditionally discussed by physicists (such as the problem of the constitution of matter) even if the means used for its solution turn out to be purely mathematical. As we have seen, the solution of problems may cut through the boundary of many sciences. Similarly, a problem may rightly be called 'philosophical' if we find that although originally it arose in connection with, say, atomic theory it is more closely connected with the problems and theories which have been discussed by philosophers than with theories nowadays treated by physicists. And again, it does not matter in the least what kind of methods we use in solving such a problem. Cosmology, for example, will always be of great philosophical interest even though in some of its methods it has become closely allied with what is perhaps better called 'physics.' To say that since it deals with factual issues it must belong to science rather than to philosophy is not only pedantic but clearly the result of an epistemological, and thus of a philosophical, dogma. Similarly, there is no reason why a problem soluble by logical means should be denied the attribute 'philosophical.' It may well be typically philosophical, or physical, or biological. Logical analysis played a considerable part in Einstein's special theory of relativity; and it was partly this fact which made the theory philosophically interesting, and which gave rise to a wide range of philosophical problems connected with it.

Wittgenstein's doctrine turns out to be the result of the thesis that all genuine statements (and therefore all genuine problems) can be classified into one of two exclusive classes: factual statements (*synthetic a posteriori*), which belong to the empirical sciences, and logical statements (*analytic a priori*), which belong to pure formal logic or pure mathematics. This simple dichotomy, although extremely valuable for a rough sur-

vey, turns out to be for many purposes too simple.[14] But although it is specially designed, as it were, to exclude the existence of philosophical problems, it falls considerably short of this aim; for even if we accept the dichotomy we can still claim that factual or logical or mixed problems may turn out, in certain circumstances, to be philosophical.

IV

I now turn to my first example: *Plato and the Crisis in Early Greek Atomism.*

My thesis here is that Plato's central philosophical doctrine, the so-called Theory of Forms or Ideas, cannot be properly understood except in an extra-philosophical context;[15] more

[14] Already in my *L.Sc.D.* of 1934 I had pointed out that a theory such as Newton's may be *interpreted* either as factual or as consisting of implicit definitions (in the sense of Poincaré and Eddington), and that the interpretation which a physicist adopts exhibits itself in his *attitude* towards tests which go against his theory rather than in what he says. I also pointed out that there are non-analytical theories which are not testable (and therefore not *a posteriori*) but which had a great influence on science. (Examples are the early atomic theory, or the early theory of action by contact.) I called such untestable theories 'metaphysical,' and asserted that they were not meaningless. The dogma of the simple dichotomy has been recently attacked, on very different lines, by F. H. Heinemann (*Proc. of the Xth Intern. Congress of Philosophy*, Fasc. 2, 629, Amsterdam, 1949), by W. V. Quine, and by Morton G. White. It may be remarked, again from a different point of view, that the dichotomy applies in a precise sense only to a formalized language, and therefore is liable to break down for those languages in which we must speak prior to any formalization, i.e., in those languages in which all the traditional problems were conceived.

[15] In my *Open Society and its Enemies* I have tried to explain in some detail another extra-philosophical root of the same doctrine—its political root. I also discussed there (in note 9 to chap. 6 of the revised 4th ed., 1962) the problem with which I am concerned in the present section, but

especially in the context of the critical *problem situation* in Greek science[16] (mainly in the theory of matter) which developed as a result of *the discovery of the irrationality of the square root of two*. If my thesis is correct, Plato's theory has not so far been fully understood. (Whether a 'full' understanding can ever be achieved is, of course, most questionable.) But a more important consequence would be that it can never be understood by philosophers trained in accordance with the *prima facie* method described in the foregoing section—unless, of course, they are specially and *ad hoc* informed of the relevant facts. (These they may have to accept on authority—which means abandoning the *prima facie* method of teaching philosophy described above.)

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from a somewhat different angle. The note referred to and the present section overlap a little; but they largely supplement each other. Relevant references (especially to Plato) omitted here will be found there.

[16] There are historians who deny that the term 'science' can be properly applied to any development which is older than the sixteenth or even the seventeenth century. But quite apart from the fact that controversies about labels should be avoided, there can, I believe, no longer be any doubt nowadays about the astonishing similarity, not to say identity, of the aims, interests, activities, arguments and methods of, say, Galileo and Archimedes, or Copernicus and Plato, or Kepler and Aristarchus (the 'Copernicus of antiquity'). And any doubt concerning the extreme age of scientific observation and of careful computations based upon observation has been dispelled by the discovery of new evidence concerning the history of ancient astronomy. We can now draw a parallel not only between Tycho and Hipparchus, but even between Hansen (1857) and Cidenas the Chaldean (314 B.C.), whose computations of the 'constants for the motion of Sun and Moon' are without exception comparable in precision to those of the best nineteenth-century astronomers. 'Cidenas' value for the motion of the Sun from the Node (0".5 too great), although inferior to Brown's, is superior to at least one of the most widely used modern values,' wrote J. K. Fotheringham in 1928, in his admirable article 'The Indebtedness of Greek to Chaldean Astronomy' (*The Observatory*, 1928, 51, No. 653), upon which my contention concerning the age of metrical astronomy is based.

It seems likely[17] that Plato's Theory of Forms is both in origin and in content closely connected with the Pythagorean theory that all things are in essence numbers. The details of this connection and the connection between Atomism and Pythagoreanism are perhaps not so well known. I will therefore briefly tell the story here, as I see it at present.

It appears that the founder of the Pythagorean order or sect was deeply impressed by two discoveries. The first was that a *prima facie* purely qualitative phenomenon such as musical harmony was, in essence, based upon the purely numerical ratios 1:2; 2:3; 3:4. The second was that the 'right' or 'straight' angle (obtainable for example by folding a leaf twice so that the two folds form a cross) was connected with the purely numerical ratios 3:4:5, or 5:12:13 (the sides of rectangular triangles). These two discoveries, it appears, led Pythagoras to the somewhat fantastic generalization that all things are, in essence, numbers or ratios of numbers; or that number is the ratio (*logos* = reason), the rational essence, of things, or their real nature.

Fantastic as this idea was, it proved fruitful in many ways. One of its most successful applications was to simple geometrical figures such as squares, rectangular and isosceles triangles, and also to certain simple solids such as pyramids. The treatment of some of these geometrical problems was based upon the so-called *gnōmōn*.

This can be explained as follows. If we indicate a square by four dots,

. .

. .

[17] If we may trust Aristotle's famous account in his *Metaphysics*.

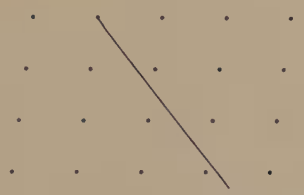
we may interpret this as the result of adding three dots to the one dot on the upper left corner. These three dots are the first *gnōmōn;* we may indicate it thus:

By adding a second *gnōmōn*, consisting of five more dots, we obtain

One sees at once that every number of the sequence of odd numbers, 1, 3, 5, 7 . . . , forms the *gnōmōn* of a square, and that the sums $1; 1 + 3; 1 + 3 + 5; 1 + 3 + 5 + 7, \ldots$ are the square numbers, and that if n is the (number of dots in the) side of a square, its area (total number of dots $= n^2$) will be equal to the sum of the first n odd numbers.

As with the treatment of squares, so with the treatment of equilateral triangles. The following figure may be regarded as representing a growing triangle—growing downwards through the addition of ever new horizontal lines of dots.

Here each *gnōmōn* is a last horizontal line of dots and each element of the sequence 1, 2, 3, 4, . . . is a *gnōmōn*. The 'triangular numbers' are the sums $1 + 2; 1 + 2 + 3; 1 + 2 + 3 + 4$, etc., that is, the sums of the first n natural numbers. By putting two such triangles side by side



we obtain the parallelogram with the horizontal side $n + 1$ and the other side n, containing $n(n + 1)$ dots. Since it consists of two isosceles triangles its number is $2(1 + 2 + \ldots + n)$, so that we obtain the equation

(1) $$1 + 2 + \ldots + n = \tfrac{1}{2}n(n + 1)$$

and thus

(2) $$d(1 + 2 + \ldots + n) = \tfrac{d}{2}n(n + 1).$$

From this it is easy to obtain the general formula for the sum of an arithmetical series.

We also obtain 'oblong numbers,' that is the numbers of oblong rectangular figures of which the simplest is

with the oblong numbers 2 + 4 + 6 . . . ; the *gnōmōn* of an oblong is an even number, and the oblong numbers are the sums of the even numbers.

These considerations were extended to solids; for example, by summing the first triangular numbers, pyramid numbers were obtained. But the main application was to plane figures, or shapes, or 'Forms.' These were believed to be characterized by the appropriate sequence of numbers, and thus by the numerical ratios of the consecutive numbers of the sequence. In other words, '*Forms are numbers or ratios of numbers.*' On the other hand, not only shapes of things, but also abstract properties, such as harmony and 'straightness' are numbers. In this way the general theory that numbers are the rational essences of all things is arrived at.

It seems probable that the development of this view was influenced by the similarity of the dot-diagrams with the diagram of a constellation such as the Lion, or the Scorpion, or the Virgo. If a Lion is an arrangement of dots it must have a number. In this way Pythagoreanism seems to be connected with the belief that the numbers, or 'Forms,' are heavenly shapes of things.

V

One of the main elements of this early theory was the so-called 'Table of Opposites,' based upon the fundamental distinction between odd and even numbers. It contains such things as

ONE	MANY
ODD	EVEN
MALE	FEMALE
REST (BEING)	CHANGE (BECOMING)
DETERMINATE	INDETERMINATE

SQUARE	OBLONG
STRAIGHT	CROOKED
RIGHT	LEFT
LIGHT	DARKNESS
GOOD	BAD

In reading through this strange table one gets some idea of the working of the Pythagorean mind, and why not only the 'Forms' or shapes of geometrical figures were considered to be numbers, in essence, but also abstract ideas, such as Justice and, of course, Harmony and Health, Beauty and Knowledge. The table is interesting also because it was taken over, with very little alteration, by Plato. The earliest version of Plato's famous theory of 'Forms' or 'Ideas' may indeed be described, somewhat roughly, as the doctrine that the 'Good' side of the Table of Opposites constitutes an (invisible) Universe, a Universe of Higher Reality, of the Unchanging and Determinate 'Forms' of all things; and that True and Certain Knowledge (*epistēmē* = *scientia* = *science*) can be of this Unchanging and Real Universe only, while the visible world of change and flux in which we live and die, the world of generation and destruction, the world of experience, is only a kind of reflection or copy of that Real World. It is only a world of appearance of which no True and Certain Knowledge can be obtained. All that can be obtained in the place of Knowledge (*epistēmē*) are the plausible but uncertain and prejudiced opinions (*doxa*) of fallible mortals.[18] In his interpretation of the Table of Opposites Plato was

[18] Plato's distinction (*epistēmē* vs. *doxa*) is derived through Parmenides from Xenophanes (*truth* vs. *conjecture* or *seeming*). Plato clearly realized that *all* knowledge of the visible world, the changing world of appearance, consists of *doxa*; that it is tainted by uncertainty even if it utilizes the *epistēmē*, the knowledge of the unchanging 'Forms' and of pure mathematics, to the utmost; and even if it interprets the visible world with the help of a theory of the invisible world. Cf. *Cratylus*, 439B ff.,

influenced by Parmenides, the man whose challenge led to the development of Democritus' atomic theory.

VI

The Pythagorean theory, with its dot-diagrams, contains no doubt the suggestion of a very primitive atomism. How far the atomic theory of Democritus was influenced by Pythagoreanism is difficult to assess. Its main influences came, so much seems certain, from the Eleatic School: from Parmenides and from Zeno. The basic problem of this school, and of Democritus, was that of the rational understanding of *change*. (I differ here from the interpretations of Cornford and others.) I think that this problem derives from Heraclitus, and thus from Ionian rather than from Pythagorean thought,[19] and that it still remains the fundamental problem of Natural Philosophy.

Although Parmenides was perhaps not a physicist (unlike

Republic, 476D ff.; and especially *Timaeus*, 29B ff., where the distinction is applied to those parts of Plato's own theory which we should nowadays call 'physics' or 'cosmology,' or, more generally, 'natural science.' They belong, Plato says, to the realm of *doxa* (in spite of the fact that science = *scientia* = *epistēmē*; cf. my remarks on this problem in chap. 20, *Conjectures and Refutations*). For a different view concerning Plato's relation to Parmenides see Sir David Ross, *Plato's Theory of Ideas* (Oxford, 1951), p. 164.

[19] Karl Reinhardt in his *Parmenides* (1916; second edition 1959, p. 220) says very forcefully: 'The history of philosophy is a history of its problems. If you want to explain Heraclitus, tell us first what his problem was.' I fully agree; and I believe, as against Reinhardt, that Heraclitus' problem was the problem of change—or more precisely, of the self-identity (*and* non-identity) of the changing thing during change. (See also my *Open Society*, chap. 2.) If we accept Reinhardt's evidence about the close link between Heraclitus and Parmenides, then this view of Heraclitus' problem makes of Parmenides' system an attempt to solve the problem of the paradoxes of change by making change unreal. As against this, Cornford and his disciples follow Burnet's doctrine that

his great Ionian predecessors), he may be described, I believe, as having fathered *theoretical physics*. He produced an anti-physical[20] (rather than a-physical, as Aristotle said) theory which, however, was the first hypothetico-deductive system. And it was the beginning of a long series of such systems of physical theories, each of which was an improvement on its predecessor. As a rule the improvement was found necessary because it was realized that the earlier system was falsified by certain facts of experience. Such an empirical refutation of the consequences of a deductive system leads to efforts at its reconstruction, and thus to a new and improved theory which as a rule clearly bears the marks of its ancestry, of the older theory as well as of the refuting experience.

These experiences or observations were, we shall see, very crude at first, but they became more and more subtle as the theories became more and more capable of accounting for the cruder observations. In the case of Parmenides' theory the clash with observation was so obvious that it would seem perhaps fanciful to describe the theory as the first hypothetico-deductive system of physics. We may, therefore, describe it as the last pre-physical deductive system, whose refutation or falsification gave rise to the first physical theory of matter, the atomistic theory of Democritus.

Parmenides' theory is simple. He finds it impossible to understand change or movement rationally, and concludes that there is really no change—or that change is only apparent. But before we indulge in feelings of superiority in the face of such a hopelessly unrealistic theory we should first realize that there is a serious problem here. If a thing X changes, then clearly it is

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Parmenides was a (dissident) Pythagorean. This may well be true, but the evidence in its favour does not show that he did not also have an Ionian teacher. (See also chap. 5, *Conjectures and Refutations*.)

20 Cp. Plato, *Theaetetus*, 181A, and Sextus Empiricus, *Adv. mathem.* (Bekker), X. 46, p. 485, 25.

no longer the same thing X. On the other hand, we cannot say that X changes without implying that X persists during the change; that it is the same thing X, at the beginning and at the end of the change. Thus it appears that we arrive at a contradiction, and that the idea of a thing that changes, and therefore the idea of change, is impossible.

All this sounds very philosophical and abstract, and so it is. But it is a fact that the difficulty here indicated has never ceased to make itself felt in the development of physics.[21] And a deterministic system such as the field theory of Einstein might even be described as a four-dimensional version of Parmenides' unchanging three-dimensional universe. For in a sense no change occurs in Einstein's four-dimensional block-universe. Everything is there just as it is, in its four-dimensional *locus*; change becomes a kind of 'apparent' change; it is 'only' the observer who as it were glides along his world-line and becomes successively conscious of the different *loci* along this world-line; that is, of his spatio-temporal surroundings . . .

To return from this new Parmenides to the older father of theoretical physics, we may paraphrase his deductive theory roughly as follows.

(1) Only what is, is.
(2) What is not does not exist.

[21] This may be seen from Emile Meyerson's *Identity and Reality*, one of the most interesting philosophical studies of the development of physical theories. Hegel (following Heraclitus, or Aristotle's account of him) took the fact of change (which he considered self-contradictory) to prove the existence of contradictions in the world, and therefore to disprove the 'law of contradiction'; i.e., the principle that our theories must avoid contradictions at all cost. Hegel and his followers (especially Engels, Lenin, and other Marxists) began to see 'contradictions' everywhere in the world, and denounced all philosophies upholding the law of contradiction as 'metaphysical,' a term which they used to imply that these philosophies ignore the fact that the world changes. See chap. 15, *Conjectures and Refutations*.

(3) Non-being, that is, the void, does not exist.
(4) The world is full.
(5) The world has no parts; it is *one* huge block (because it is full).
(6) Motion is impossible (since there is no empty space into which anything could move).

The conclusions (5) and (6) were obviously contradicted by facts. Thus Democritus argued from the falsity of the conclusion to that of the premises:

(6′) There is motion (thus motion is possible).
(5′) The world has parts; it is not one, but many.
(4′) Thus the world cannot be full.[22]
(3′) The void (or non-being) exists.

So far the theory had to be altered. With regard to being, or to the many existing things (as opposed to the void), Democritus adopted Parmenides' theory that they had no parts. They were indivisible (atoms), because they were full, because they had no void inside.

The main point about this theory is that it gives a rational account of change. The world consists of empty space (the void) with atoms in it. The atoms do not change; they are Parmenidean indivisible block universes in miniature.[23] All change

[22] The inference from the existence of motion to that of a void is not valid because Parmenides' inference from the fullness of the world to the impossibility of motion is not valid. Plato seems to have been the first to see, if only dimly, that in a full world circular or vortex-like motion is possible, provided that there is a liquid-like medium in the world. (Tea leaves can move with the vortex of tea in the cup.) This idea, first offered somewhat half-heartedly in the *Timaeus* (where *space is 'filled,'* 52E) becomes the basis of Cartesianism and of the theory of the 'luminiferous ether' as it was held down to 1905. (See also note 44, below.)

[23] Democritus' theory also admitted large block-atoms, but the vast majority of his atoms were invisibly small.

is due to rearrangement of atoms in space. Accordingly *all change is movement.* Since the only kind of novelty which can arise on this view is novelty of arrangement,[24] it will be possible, in principle, *to predict all future changes in the world,* provided we manage to predict the motion of all atoms (or, in modern parlance, all mass-points).

Democritus' theory of change was of tremendous importance for the development of physical science. It was partly accepted by Plato, who retained much of atomism, explaining change, however, not only by unchanging yet moving atoms but also by other 'Forms' which were subject neither to change nor to motion. But it was condemned by Aristotle who taught in its stead[25] that all change was the unfolding of the inherent potentialities of essentially unchanging *substances.* Aristotle's theory of substances as the subjects of change became dominant; but it proved barren;[26] and Democritus' metaphysical theory that all change must be explained by movement became the tacitly accepted programme of work in physics down to our own day. It is still part of the philosophy of physics, in spite of the fact that physics itself has outgrown it (to say nothing of the biological and social sciences). For with Newton, in addition to moving mass-points, *forces* of changing intensity (and direction) enter the scene. True, the changes of the Newtonian forces

[24] Cp. *The Poverty of Historicism,* section 3.

[25] Inspired by Plato's *Timaeus,* 55, where the potentialities of the elements are explained by the geometrical properties (and thus the substantial forms) of the corresponding solids.

[26] The barrenness of the 'essentialist' (cf. note 2 above) theory of substance is connected with its anthropomorphism; for substances (as Locke saw) take their plausibility from the experience of a self-identical but changing and unfolding self. But although we may welcome the fact that Aristotle's substance has disappeared from *physics,* there is nothing wrong, as Professor Hayek says, in thinking anthropomorphically about *man;* and there is no philosophical or *a priori* reason why it should disappear from psychology.

can be explained as due to, or dependent upon, motion; that is, upon the changing position of particles. But they are nevertheless not identical with changes in the position of particles; owing to the inverse square law the dependence is not even a linear one. And with Faraday and Maxwell, changing fields of forces become as important as material atomic particles. That our modern atoms turn out to be composite is a minor matter; from Democritus' point of view not our atoms but rather our elementary particles would be the real atoms—except that these too turn out to be liable to change. Thus we have a most interesting situation. A philosophy of change, designed to meet the difficulty of understanding change rationally, serves science for thousands of years, but is ultimately superseded by the development of science itself; and this fact passes practically unnoticed by philosophers who are busily denying the existence of philosophical problems.

Democritus' theory was a marvellous achievement. It provided a theoretical framework for the explanation of most of the empirically known properties of matter (discussed already by the Ionians), such as compressibility, degrees of hardness and resilience, rarefaction and condensation, coherence, disintegration, combustion, and many others. But the theory was important not only as an explanation of the phenomena of experience. First, it established the methodological principle that a deductive theory or explanation must 'save the phenomena,' that is, must be in agreement with experience. Secondly, it showed that a theory may be speculative, and based upon the fundamental (Parmenidean) principle that the world as it must be understood by argumentative thought turns out to be different from the world of *prima facie* experience, from the world as seen, heard, smelled, tasted, touched;[27] and that such a

[27] Cf. Democritus, Diels, fragm. 11 (cf. Anaxagoras, Diels, fragm. 21; see also fragm. 7).

speculative theory may nevertheless accept the empiricist 'criterion' that it is the visible that decides the acceptance or rejection of a theory of the invisible[28] (such as the atoms). This philosophy has remained fundamental to the whole development of physics, and has continued to conflict with all 'relativistic'[29] and 'positivistic'[30] philosophical tendencies.

Furthermore, Democritus' theory led to the first successes of the method of exhaustion (the forerunner of the calculus of integration), since Archimedes himself acknowledged that Democritus was the first to formulate the theory of the volumes of cones and pyramids.[31] But perhaps the most fascinating element in Democritus' theory is his doctrine of the quantization of space and time. I have in mind the doctrine, now extensively discussed,[32] that there is a *shortest distance* and a *smallest time interval;* that is to say, that there are distances in space and time (elements of length and time, Democritus' *amerēs*[33] in

[28] Cf. Sextus Empiricus, *Adv. mathem.* (Bekker), VII. 140, p. 221, 23B.

[29] 'Relativistic' in the sense of philosophical relativism, e.g., of Protagoras' *homo mensura* doctrine. It is, unfortunately, still necessary to emphasize that Einstein's theory has nothing in common with this philosophical relativism.

[30] 'Positivistic' as were the tendencies of Bacon; of the theory (but fortunately not the practice) of the early *Royal Society;* and in our time of Mach (who opposed atomic theory), and of the sense-data theorists.

[31] Cf. Diels, fragm. 155, which must be interpreted in the light of Archimedes (ed. Heiberg) II^2, p. 428 f. Cf. S. Luria's most important article 'Die Infinitesimalmethode der antiken Atomisten' (*Quellen & Studien zur Gesch. d. Math.*, Abt. B. Bd. 2, Heft 2, 1932, p. 142).

[32] Cf. A. March, *Natur und Erkenntnis* (Vienna, 1948) p. 193 f.

[33] Cf. S. Luria, *op. cit.*, especially pp. 148 ff., 172 ff. Miss A. T. Nicol in 'Indivisible Lines' (*Class. Quarterly*, XXX [1936], 120 f.) argues that 'two passages, one from Plutarch, the other from Simplicius' show why Democritus 'could not believe in indivisible lines'; she does not however discuss Luria's opposing views of 1932, which I find much more convincing, especially if we remember that Democritus tried to answer Zeno (see next note). But whatever Democritus' views on indivisible or

contradistinction to his atoms) such that no smaller ones are possible.

VII

Democritus' atomism was developed and expounded as a point for point reply[34] to the detailed arguments of his Eleatic predecessors, of Parmenides and his pupil Zeno. Especially Democritus' theory of atomic distances and time intervals is the direct result of Zeno's arguments, or more precisely, of the rejection of Zeno's conclusions. But nowhere in what we know of Zeno is there an allusion to the *discovery of irrationals* which is of decisive importance for our story.

We do not know the date of the proof of the irrationality of the square root of two, or the date when the discovery became publicly known. Although there existed a tradition ascribing it to Pythagoras (sixth century B.C.), and although some authors[35] call it the 'theorem of Pythagoras,' there can be

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atomic distances, Plato appears to have thought that Democritus' atomism needed revision in the light of the discovery of the irrationals. Heath however (*Greek Mathematics*, 1, 1921, p. 181, referring to Simplicius and Aristotle) also believes that Democritus did not teach the existence of indivisible lines.

[34] This point for point reply is preserved in Aristotle's *On Generation and Corruption*, 316A, 14 ff., a very important passage first identified as Democritean by I. Hammer-Jensen in 1910 and carefully discussed by Luria who says (*op. cit.*, 135) of Parmenides and Zeno: 'Democritus borrows their deductive arguments, but he arrives at the opposite conclusion.'

[35] Cf. G. H. Hardy and E. M. Wright, *Introduction to the Theory of Numbers*, 1938, pp. 39, 42, where a very interesting historical remark on Theodorus' proof, as reported in Plato's *Theaetetus*, will be found. See now also the article by A. Wasserstein, 'Theaetetus and the History of the Theory of Numbers,' *Classical Quarterly*, 8, N.S. (1958), pp. 165–179, the best discussion of the subject known to me.

little doubt that the discovery was not made, and certainly not publicly known, before 450 B.C., and probably not before 420. Whether Democritus knew about it is uncertain. I now feel inclined to believe that he did not; and that the title of Democritus' two lost books, *Peri alogōn grammōn kai nastōn*, should be translated *On Illogical Lines and Full Bodies* (*Atoms*),[36] and that these two books do not contain any reference to the discovery of irrationality.[37]

My belief that Democritus was unaware of the problem of irrationals is based on the fact that there are no traces of a

[36] Rather than *On Irrational Lines and Atoms*, as I translated it in note 9 to chap. 6 of my *Open Society* (second ed.). What is probably meant by the title (considering Plato's passage mentioned in the next note) might, I think, be best rendered by '*On Crazy Lines and Atoms.*' Cf. H. Vogt, *Bibl. Math.*, 1910, 10, 147 (against whom Heath argues, *op. cit.*, 156 f., but not I think quite successfully) and S. Luria, *op. cit.*, pp. 168 ff., where it is convincingly suggested that (Arist.) *De lin. insec.*, 968b17 and Plutarch, *De comm. notit.*, 38, 2, p. 1078 f., contain traces of Democritus' work. According to these sources, Democritus' argument was this. *If lines are infinitely divisible* then they are composed of an infinity of ultimate units and are therefore *all* related like $\infty : \infty$, that is to say, they are all 'non-comparable' (there is no proportion). Indeed, if lines are considered as classes of points, the cardinal 'number' (potency) of the points of a line is, according to modern views, equal for all lines, whether the lines are finite or infinite. This fact has been described as 'paradoxical' (for example, by Bolzano) and might well have been described as 'crazy' by Democritus. It may be noted that according to Brouwer even the classical theory of the Lebesgue *measure* of a continuum leads to fundamentally the same results; for Brouwer asserts that all classical continua have zero measure, so that the absence of a ratio is here expressed by $0 : 0$. Democritus' result (and his theory of *amerēs*) appears to be inescapable as long as geometry is based on the Pythagorean *arithmetical method*, i.e., on the counting of dots.

[37] This would be in keeping with the fact, mentioned in the note cited from the *Open Society*, that the term '*alogos*' was, it seems, only much later used for 'irrational,' and that Plato, who alludes (*Republic* 534D) to Democritus' title, uses '*alogos*' there in the sense of 'crazy'; he never uses it as a synonym for '*arrhētos*' as far as I know.

defence of his theory against the blow which it received from this discovery. Yet the blow was as fatal to atomism as it was to Pythagoreanism. Both theories were based on the doctrine that all measurement is, ultimately, counting of natural units, so that every measurement must be reducible to pure numbers. The distance between any two atomic points must, therefore, consist of a certain number of atomic distances; thus all distances must be commensurable. But this turns out to be impossible even in the simple case of the distances between the corners of a square, because of the incommensurability of its diagonal d with its side a.

The English term 'incommensurable' is somewhat unfortunate. What is meant is, rather, the non-existence of a *ratio of natural numbers;* for example, what can be proved in the case of the diagonal of the unit square is that there do not exist two natural numbers, n and m, whose ratio, n/m, is equal to the diagonal of the unit square. 'Incommensurability' thus does not mean incomparability by geometrical methods, or by *measurement,* but incomparability by arithmetical methods of *counting,* or by natural numbers, including the characteristic Pythagorean method of comparing *ratios* of natural numbers and including, of course, the counting of units of length (or of 'measures').

Let us look back, for a moment, at the characteristics of this *method of natural numbers and their ratios.* Pythagoras' emphasis upon Number was fruitful from the point of view of the development of scientific ideas. This is often but somewhat loosely expressed by saying that the Pythagoreans initiated numerical scientific measurement. Now what I want to emphasize is that for the Pythagoreans all this was *counting rather than measuring.* It was the counting of numbers, of invisible essences or 'Natures' which were Numbers of little dots. They knew that we cannot count these little dots directly, since they are in-

visible and that we actually do not *count* the Numbers or Natural Units, but *measure*, i.e., count arbitrary visible units. But they interpreted the significance of measurements as revealing, indirectly, the true *Ratios of the Natural Units or of the Natural Numbers.*

Thus Euclid's methods of proving the so-called 'Theorem of Pythagoras' (Euclid, 1,47) according to which, if a is the side of a triangle opposite to its right angle between b and c,

$$a^2 = b^2 + c^2, \tag{1}$$

was foreign to the spirit of Pythagorean mathematics. It seems now accepted that the theorem was known to the Babylonians and geometrically proved by them. Yet neither Pythagoras nor Plato appear to have known Euclid's *geometrical* proof (which uses different triangles with common base and height); for the problem for which they offered solutions, the *arithmetical* one of finding the integral solutions for the sides of rectangular triangles, can, if (1) is known, be easily solved by the formula (m and n are natural numbers, and $m > n$)

$$a = m^2 + n^2; \qquad b = 2mn; \qquad c = m^2 - n^2. \tag{2}$$

But formula (2) was apparently unknown to Pythagoras and even to Plato. This emerges from the tradition[38] according to which Pythagoras proposed the formula (obtained from (2) by putting $m = n + 1$)

$$a = 2n(n + 1) + 1; \qquad b = 2n(n + 1); \qquad c = 2n + 1 \tag{3}$$

which can be read off the *gnōmōn* of the square numbers, but which is less general than (2), since it fails, for example, for 17 : 8 : 15. To Plato, who is reported[39] to have improved Pythag-

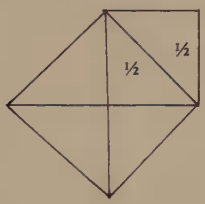
[38] *Procli Diadochi in primum Euclidis Elementorum librum commentarii*, ed. G. Friedlein (Leipzig, 1873), p. 487, 7–21.

[39] By Proclus, *op. cit.*, pp. 428, 21–429, 8.

oras' formula (3), is attributed another formula which still falls short of the general solution (2).

In order to show the difference between the Pythagorean or arithmetical method and the geometrical method, Plato's proof that the square over the diagonal of the unit square (that is, the square with the side 1 and an area of measure 1) has an area of twice the unit square (that is, an area of measure 2) may be mentioned. It consists in drawing a square with the diagonal

and then showing that we may extend the drawing thus



from which we obtain the result by counting. But the transition from the first to the second of these figures cannot possibly be shown to be valid by the arithmetic of dots, and not even by the method of ratios.

That this is, indeed, impossible, is established by the famous proof of the irrationality of the diagonal, that is, of the square root of 2, assumed as well-known by Plato and Aristotle. It consists in showing that the assumption

(1) $$\sqrt{2} = n/m$$

that is, that $\sqrt{2}$ is equal to a ratio of any two natural numbers, n and m, leads to an absurdity.

We first note that we can assume that

(2) *not more than one* of the two numbers, n and m, is even.

For if both were even, then we could always cancel out the factor 2 so as to obtain two other natural numbers, n' and m', such that $n/m = n'/m'$, and such that at most one of the two numbers, n' and m', would be even. Now by squaring (1) we get

(3) $$2 = n^2/m^2$$

and from this

(4) $$2m^2 = n^2$$

and thus

(5) n is even.

Thus there must exist a natural number a so that

(6) $$n = 2a$$

and we get from (4) and (6)

(7) $$2m^2 = n^2 = 4a^2$$

and thus

(8) $$m^2 = 2a^2.$$

But this means

(9) m is even.

It is clear that (5) and (9) contradict (2). Thus the assumption that there are two natural numbers, n and m, whose ratio equals $\sqrt{2}$, leads to an absurd conclusion. Therefore $\sqrt{2}$ is not a ratio, it is 'irrational.'

This proof uses only the arithmetic of natural numbers. It therefore uses purely Pythagorean methods, and the tradition that it was discovered within the Pythagorean school need not be questioned. But it is improbable that the discovery was made by Pythagoras, or that it was made very early: Zeno does not seem to know it, nor does Democritus. Moreover, as it destroys the basis of Pythagoreanism, it is reasonable to assume that it

was not made long before the order reached the height of its influence; at least not before it was well established; for it seems to have contributed to its decline. The tradition that it was made within the order but kept secret seems to me very plausible. It may be supported by considering that the old term for 'irrational'—'*arrhētos*,' 'unutterable,' or 'unmentionable'—may well have hinted at an unmentionable secret. Tradition has it that the member of the school who gave away the secret was killed for his treachery.[40] However this may be, there is little doubt that the realization that irrational magnitudes (they were, of course, not recognized as numbers) existed, and that their existence could be proved, undermined the faith of the Pythagorean order, and destroyed the hope of deriving cosmology, or even geometry, from the arithmetic of natural numbers.

VIII

It was Plato who realized this fact, and who in the *Laws* stressed its importance in the strongest possible terms, denouncing his compatriots for their failure to gauge its implications. I believe that his whole philosophy, and especially his theory of 'Forms' or 'Ideas,' was influenced by it.

Plato was very close to the Pythagorean as well as to the Eleatic School; and although he appears to have felt antipathetic to Democritus he was himself a kind of atomist. (Atomist teaching remained as one of the school traditions of the Academy.[41]) This is not surprising in view of the close relation between Pythagorean and atomistic ideas. But all this

[40] The story is told of one Hippasus, a somewhat shadowy figure; he is said to have died at sea (cf. Diels[6], 4). See also A. Wasserstein's article mentioned in note 35, above.

[41] See S. Luria, especially on Plutarch, *loc. cit.*

was threatened by the discovery of the irrationals. I suggest that Plato's main contribution to science sprang from his realization of the problem of the irrational, and from the modification of Pythagoreanism and atomism which he undertook in order to rescue science from a catastrophic situation.

He realized that the purely arithmetical theory of nature was defeated, and that a new mathematical method for the description and explanation of the world was needed. Thus he encouraged the development of an autonomous geometrical method. It found its fulfillment in the 'Elements' of the Platonist Euclid.

What are the facts? I shall try briefly to put them all together.

(1) Pythagoreanism and atomism in Democritus' form were both fundamentally based on arithmetic; that is to say on counting.

(2) Plato emphasized the catastrophic character of the discovery of the irrationals.

(3) He inscribed over the gates of the Academy: 'Nobody Untrained in Geometry May Enter My House.' But *geometry*, according to Plato's immediate pupil Aristotle[42] as well as Euclid, typically treats of incommensurables or irrationals, in contradistinction to *arithmetic* which treats of 'the odd and the even' (i.e., of integers and their relations).

(4) Within a short time after Plato's death his school produced, in Euclid's *Elements*, a work one of whose main points was that it freed mathematics from the 'arithmetical' assumption of commensurability or rationality.

(5) Plato himself contributed to this development, and especially to the development of solid geometry.

(6) More especially, he gave in the *Timaeus* a specifically

[42] *An. Post.*, 76b9; *Metaph.*, 983a20, 1061b1. See also *Epinomis*, 990D.

geometrical version of the formerly purely arithmetical atomic theory; a version which constructed the elementary particles (the famous Platonic bodies) out of triangles which incorporated the irrational square roots of two and of three. (See below.) In nearly all other respects he preserved Pythagorean ideas as well as some of the most important ideas of Democritus.[43] At the same time he tried to eliminate Democritus' void; for he realized[44] that motion remains possible even in a 'full' world, provided motion is conceived as of the character of vortices in a liquid. Thus he retained some of the most fundamental ideas of Parmenides.[45]

(7) Plato encouraged the construction of geometrical models of the world, and especially models explaining the planetary movements. And I believe that Euclid's geometry was not intended as an exercise in pure geometry (as is now usually assumed), but as an *organon* of a *theory of the world*. According

[43] Plato took over, more especially, Democritus' theory of vortices (Diels, fragm. 167, 164; cf. Anaxagoras, Diels, 9, and 12, 13; see also the next two footnotes) and his theory of what we nowadays would call gravitational phenomena (Diels, 164; Anaxagoras, 12, 13, 15, and 2)—a theory which, slightly modified by Aristotle, was ultimately discarded by Galileo.

[44] The clearest passage is *Timaeus*, 80c, where it is said that neither in the case of (rubbed) amber nor of the 'Heraclean stone' (magnet) is there any real attraction; 'there is no void and these things push themselves around, one upon another.' On the other hand Plato was not too clear on this point, since his elementary particles (other than the cube and the pyramid) cannot be packed without leaving some (empty?) space between them, as Aristotle observed in *De Caelo*, 306b5. See also note 22 above (and *Timaeus*, 52E).

[45] Plato's reconciliation of atomism and the theory of the *plenum* ('nature abhors the void') became of the greatest importance for the history of physics down to our day. For it strongly influenced Descartes, became the basis of the theory of ether and light, and thus ultimately, via Huyghens and Maxwell, of de Broglie's and of Schrödinger's wave mechanics. See my report in *Atti d. Congr. Intern. di Filosofia* (1958), 2 (1960), pp. 367 ff.

to this view the 'Elements' is not a 'textbook of geometry' but an attempt to solve systematically the main problems of Plato's cosmology. This was done with such success that the problems, having been solved, disappeared and were almost forgotten; though a trace remains in Proclus who writes, 'Some have thought that the subject matter of the various books [of Euclid] pertains to the cosmos, and that they are intended to help us in our contemplation of, and theorizing about, the universe' (*op. cit.*, note 38 above, Prologus, II, p. 71, 2–5). Yet even Proclus does not mention in this context the main problem—that of the irrationals (of course he does mention it elsewhere); though he points out, rightly, that the 'Elements' culminate with the construction of the 'cosmic' or 'Platonic' regular polyhedra. Ever since[46] Plato and Euclid, but not before, geometry (rather than arithmetic) appears as the fundamental instrument of all physical explanations and descriptions, in the theory of matter as well as in cosmology.[47]

[46] An exception is the reappearance of arithmetical methods in Quantum Theory, e.g., in the electron shell theory of the periodic system based upon Pauli's exclusion principle; an inversion of Plato's tendency to *geometrize arithmetic* (see below).

Concerning the modern tendency towards what is sometimes called 'arithmetization of geometry' (a tendency which is by no means characteristic of all modern work on geometry), or of analysis, it should be noted that it shows little similarity to the Pythagorean approach since *sets*, or *infinite sequences*, of natural numbers are its main instruments, rather than the natural numbers themselves.

Only those who confine themselves to 'constructive' or 'finitist' or 'intuitionist' methods of number theory—as opposed to set-theoretic methods—might claim that their attempts to reduce geometry to number theory resemble Pythagorean or pre-Platonic ideas of arithmetization. A great step in this direction has been achieved quite recently, it seems, by the German mathematician E. de Wette.

[47] For a similar view of Plato's and Euclid's influence, see G. F. Hemens, *Proc. of the Xth Intern. Congress of Philosophy* (Amsterdam, 1949), Fasc. 2, 847.

IX

These are the historical facts. They go a long way, I believe, towards establishing my main thesis: that what I have called the *prima facie* method of teaching philosophy cannot lead to an understanding of the problems which inspired Plato. Nor can it lead to an appreciation of what may be justly claimed to be his greatest philosophical achievement, the geometrical theory of the world. The great physicists of the Renaissance—Copernicus, Galileo, Kepler, Gilbert—who turned from Aristotle to Plato intended by this move to replace the Aristotelian qualitative substances or potentialities by a geometrical method of cosmology. Indeed, that is what the Renaissance (in science) largely meant: a renaissance of the geometrical method, which was the basis of the works of Euclid, Aristarchus, Archimedes, Copernicus, Kepler, Galileo, Descartes, Newton, Maxwell, and Einstein.

But is this achievement properly described as philosophical? Does it not rather belong to physics—a factual science; and to pure mathematics—a branch, as Wittgenstein's school would contend, of tautological logic?

I believe that we can at this stage see fairly clearly why Plato's achievement (although it has no doubt its physical, its logical, its mixed, and its nonsensical components) was a philosophical achievement; why at least part of his philosophy of nature and of physics has lasted and, I believe, will last.

What we find in Plato and his predecessors is the conscious construction and invention of a new approach towards the world and towards knowledge of the world. This approach transforms an originally theological idea, *the idea of explaining*

the visible world by a postulated invisible world,[48] into the fundamental instrument of theoretical science. The idea was explicitly formulated by Anaxagoras and Democritus[49] as the principle of investigation into the nature of matter or body; visible matter was to be explained by hypotheses about invisibles, about an *invisible structure which is too small to be seen.* With Plato this idea is consciously accepted and generalized; the visible world of change is ultimately to be explained by an invisible world of unchanging 'Forms' (or substances, or essences, or 'natures'; that is, as I shall try to show in more detail, geometrical shapes or figures).

Is this idea about the invisible structure of matter a physical or a philosophical idea? If a physicist merely *acts* upon this theory, if he accepts it, perhaps unconsciously, by accepting the traditional problems of his subject as furnished by the problem-situation with which he is confronted; and if he, so acting, produces a new specific theory of the structure of matter, then I should not call him a philosopher. But if he reflects upon it, and, for example, rejects it (like Berkeley or Mach), preferring a phenomenological or positivistic physics to the theoretical and somewhat theological approach, then he may be called a philosopher. Similarly, those who consciously sought the theoretical approach, who constructed it, and who explicitly formulated it, and thus transferred the hypothetical and deductive method from theology to physics, were philosophers, even though they were physicists in so far as they acted upon their own precepts and tried to produce actual theories of the invisible structure of matter.

[48] Cf. Homer's explanation of the visible world around Troy with the help of the invisible world of the Olympus. The idea loses, with Democritus, some of its theological character (which is still strong in Parmenides, although less so in Anaxagoras) but regains it with Plato, only to lose it again soon afterwards.

[49] See note 27 above, and Anaxagoras, Fragments B4 and 17, Diels-Kranz.

But I shall not pursue the question of the proper application of the label 'philosophy' any further; for this problem, which is Wittgenstein's problem, clearly turns out to be one of linguistic usage; it is indeed a pseudo-problem, and one which by now must be rapidly degenerating into a bore to my audience. Yet I wish to add a few words on Plato's theory of Forms or Ideas, or, to be more precise, on point (6) in the list of historical facts given above.

Plato's theory of the structure of matter can be found in the *Timaeus*. It has at least a superficial similarity to the modern theory of solids which interprets them as crystals. His physical bodies are composed of invisible elementary particles of various shapes, the shapes being responsible for the macroscopic properties of visible matter. The shapes of the elementary particles are determined in their turn by the shapes of the plane figures which form their sides. And these plane figures, in their turn, are ultimately all composed of *two* elementary triangles: the half-square (*or isosceles* rectangular) triangle which incorporates the *square root of two*, and the half-equilateral rectangular triangle which incorporates the *square root of three*, both of them irrationals.

These triangles, in their turn, are described as the copies[50] of unchanging 'Forms' or 'Ideas,' which means that specifically *geometrical* 'Forms' are admitted into the heaven of the Pythagorean *arithmetical* Form-Numbers.

There is little doubt that the motive of this construction

[50] For the process by which the triangles are stamped out of space (the 'mother') by the ideas (the 'fathers'), cf. my *Open Society*, note 15 to chap. 3, and the references there given, as well as note 9 to chap. 6. In admitting irrational triangles into his heaven of divine Forms Plato admits something 'indeterminable' in the sense of the Pythagoreans, i.e., something belonging to the 'Bad' side of the Table of Opposites. That 'bad' things may have to be admitted seems to be first stated in Plato's *Parmenides*, 130BE; the admission is put into the mouth of Parmenides himself.

is the attempt to solve the crisis of atomism by incorporating irrationals into the last elements of which the world is built. Once this has been done the difficulty arising from the existence of irrational distances is overcome.

But why did Plato choose just these two triangles? I have elsewhere[51] expressed the view, as a conjecture, that Plato believed that all other irrationals might be obtained by adding to the rationals multiples of the square roots of two and three.[52] I now feel more confident that the crucial passage in the *Timaeus* does imply this doctrine (which was mistaken, as Euclid later showed). For in the passage in question Plato says quite clearly, '*All* triangles are derived from two, each having a right angle,' going on to specify these two as the half-square and half-equilateral. But in the context this can only mean that *all* triangles can be composed by combining these two, a view which is equivalent to the mistaken theory of the relative commensurability of all irrationals with sums of rationals and the square roots of two and three.[53]

But Plato did not pretend that he had a proof of the theory in question. On the contrary, he says that he assumes the two triangles as principles, 'in accordance with an account which combines likely conjecture with necessity.' And a little later, after explaining that he takes the half-equilateral triangle as the second of his principles, he says, 'The reason is too long a story;

[51] In the last quoted note of my *Open Society*.

[52] This would mean that all geometrical distances (magnitudes) are commensurable with one of *three* 'measures' (or a sum of two or all of them) related as $1 : \sqrt{2} : \sqrt{3}$. It seems likely that Aristotle even believed that all geometrical magnitudes are commensurable with one of *two* measures, viz. 1 and $\sqrt{2}$. For he writes (*Metaphysics*, 1053a17): 'The diagonal and the side of a square and all (geometrical) magnitudes are measured by two (measures).' (Cp. Ross' note on this passage.)

[53] In note 9 to chap. 6 of my *Open Society*, mentioned above, I also conjectured that the approximation of $\sqrt{2} + \sqrt{3}$ to π encouraged Plato in his mistaken theory.

but if anybody should probe into this matter, and prove that it has this property' (I suppose the property that all other triangles can be composed of these two) 'then the prize is his, with all our good will.'[54] The language is somewhat obscure, and the likely reason is that Plato was conscious that he lacked a proof of his (mistaken) conjecture concerning these two triangles, and felt it should be supplied by somebody.

The obscurity of the passage had, it appears, the strange effect that Plato's quite clearly stated choice of triangles which introduce *irrationals* into his world of Forms escaped the notice of most of his readers and commentators in spite of Plato's emphasis upon the problem of irrationality in other places. And this in turn may perhaps explain why Plato's Theory of Forms could appear to Aristotle to be fundamentally the same as the Pythagorean theory of form-numbers,[55] and why Plato's atom-

[54] The two quotations are from the *Timaeus*, 53CD and 54AB.

[55] I believe that our consideration may throw some light on the problem of Plato's famous two 'principles'—'The One' and 'The Indeterminate Dyad.' The following interpretation develops a suggestion made by van der Wielen (*De Ideegetallen van Plato*, 1941, p. 132 f.) and brilliantly defended against van der Wielen's own criticism by Ross (*Plato's Theory of Ideas*, p. 201). We assume that the 'Indeterminate Dyad' is a straight line or distance, not to be interpreted as a unit distance, or as having yet been measured at all. We assume that a point (limit, *monas*, 'One') is placed successively in such positions that it divides the Dyad according to the ratio $1 : n$, for any natural number n. Then we can describe the 'generation' of the numbers as follows. For $n = 1$, the Dyad is divided into two parts whose ratio is $1 : 1$. This may be interpreted as the 'generation' of Twoness out of Oneness ($1 : 1 = 1$) and the Dyad, since we have divided the Dyad into *two* equal parts. Having thus 'generated' the number 2, we can divide the Dyad according to the ratio $1 : 2$ (and the larger of the ensuing sections, as before, according to the ratio $1 : 1$), thus generating *three* equal parts and the number 3; generally, the 'generation' of a number n gives rise to a division of the Dyad in the ratio $1 : n$, and with this, to the 'generation' of the number $n + 1$. (And in each stage the 'One' intervenes afresh as the point which introduces a limit or form or measure into the otherwise 'indeterminate' Dyad to create the new number; this remark may strengthen Ross' case against van der Wielen's. Cp.

ism appeared to Aristotle merely as a comparatively minor variation on that of Democritus.[56] Aristotle, in spite of taking for granted both the association of arithmetic with the odd and even, and of geometry with the irrational, does not appear to

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also Toeplitz's, Stenzel's, and Becker's papers in *Quellen & Studien z. Gesch d. Math.*, I, 1931. None of them, however, hint at a *geometrization of arithmetic*—in spite of the figures on pp. 476 f.)

Now it should be noted that this procedure, although it 'generates' (in the first instance, at least) only the series of natural numbers, nevertheless contains a *geometrical* element—the division of a line, first into two equal parts, and then into two parts according to a certain proportion $1 : n$. Both kinds of division are in need of geometrical methods, and the second, more especially, needs a method such as Eudoxus' Theory of Proportions. Now I suggest that Plato began to ask himself why he should not divide the Dyad also in the proportion of $1 : \sqrt{2}$ and of $1 : \sqrt{3}$. This, he must have felt, was a departure from the method by which the natural numbers are generated; it is less 'arithmetical' still, and it needs more specifically 'geometrical' methods. But it would 'generate,' in the place of natural numbers, linear elements in the proportion $1 : \sqrt{2}$ and $1 : \sqrt{3}$, which may be identical with the 'atomic lines' (*Metaphysics*, 992a19) from which the atomic triangles are constructed. At the same time the characterization of the Dyad as 'indeterminate' would become highly appropriate, in view of the Pythagorean attitude (cf. Philolaos, Diels, fragm. 2 and 3) towards the irrational. (Perhaps the name 'The Great and the Small' began to be replaced by 'The Indeterminate Dyad' when irrational proportions were generated in addition to rational ones.)

Assuming this view to be correct, we might conjecture that Plato slowly approached (beginning in the *Hippias Major*, and thus long before the *Republic*—as opposed to a remark made by Ross, *op. cit.*, top of p. 56) the view that *the irrationals are numbers* (*a*) since they are comparable with numbers (*Met.*, 1021a4 f.) and (*b*) since both the natural numbers and the irrationals are 'generated' by similar and *essentially geometric* processes. Yet once this view is reached and it was first reached, it appears, in the *Epinomis*, 990DE, whether or not this work is, as I am inclined to believe, Plato's), then even the irrational triangles of the *Timaeus* become 'numbers' (i.e., characterized by numerical, if irrational, proportions). But at this point the peculiar contribution of Plato, and the difference between his and the Pythagorean theory, may become indiscernible; which may explain why it has been lost sight of even by Aristotle (who suspected both 'geometrization' *and* 'arithmetization').

[56] That this was Aristotle's view has been pointed out by Luria, *op. cit.*

have taken the problem of the irrationals seriously. Proceeding as he did from an interpretation of the *Timaeus* which identified Plato's Space with matter, he seems to have taken Plato's reform programme for geometry for granted; it had been partly carried out by Eudoxus before Aristotle entered the Academy, and Aristotle was only superficially interested in mathematics. He never alludes to the inscription over the Academy gates.

To sum up, it seems probable that Plato's theory of Forms and also his theory of matter were both restatements of the theories of his predecessors, the Pythagoreans and Democritus respectively, in the light of his realization that the irrationals demanded that geometry should come before arithmetic. By encouraging this emancipation Plato contributed to the development of Euclid's system, the most important and influential deductive theory ever constructed. By his adoption of geometry as the theory of the world he provided Aristarchus, Newton, and Einstein with their intellectual toolbox. The calamity of Greek atomism was thus transformed into a momentous achievement. But Plato's scientific interests are partly forgotten. The problem-situation in science which gave rise to his philosophical problems is little understood. And his greatest achievement, the geometrical theory of the world, has influenced our world-picture to such an extent that we unreflectingly take it for granted.

X

One example never suffices. As my second example, out of a great many interesting possibilities, I choose Kant. His *Critique of Pure Reason* is one of the most difficult books ever written. Kant wrote in great haste,[57] and about a problem which, I shall

[57] He was afraid that he might die before completing his work.

try to show, was not only insoluble but also misconceived. Nevertheless it was not a pseudo-problem, but an inescapable problem which arose out of the contemporary situation in science.

His book was written for people who knew something about Newton's stellar dynamics and who had at least some idea of his forerunners—of Copernicus, Tycho Brahe, Kepler and Galileo.

It is perhaps hard for intellectuals of our day, spoilt and blasé as we are by the spectacle of scientific success, to realize what Newton's theory meant, not just for Kant but for any eighteenth-century thinker. After the unmatched daring with which the Ancients had tackled the riddle of the Universe there had come long periods of decay and recovery, and then a staggering success. Newton had discovered the long sought secret. His geometrical theory, based on and modelled after Euclid, had been received at first with great misgivings, even by its own originator.[58] The reason was that the gravitational force of attraction was felt to be 'occult,' or at least something which needed an explanation. But although no plausible explanation was found (and Newton scorned recourse to *ad hoc* hypotheses) all misgivings had disappeared long before Kant made his own important contribution to Newtonian theory, seventy-eight years after the *Principia*.[59] No qualified judge[60] of the situation could doubt any longer that Newton's theory was true. It had been tested by the most precise measurements, and

[58] See Newton's letters to Bentley, 1693. (Cf. note 20 to chap. 3, *Conjectures and Refutations.*)

[59] The so-called Kant-Laplacean Hypothesis, published by Kant in 1755.

[60] There had been some very pertinent criticism (especially by Leibniz and Berkeley) but in view of the success of the theory it was—I believe rightly—felt that the critics had somehow missed the point of the theory. We must not forget that even today the theory still stands, with only minor modifications, as an excellent first approximation (or, in view of Kepler, perhaps as a second approximation).

it had always been right. It had led to the prediction of minute deviations from Kepler's laws, and to new discoveries. In a time like ours, when theories come and go like the buses in Piccadilly, and when every schoolboy has heard that Newton has long been superseded by Einstein, it is hard to recapture the sense of conviction which Newton's theory inspired, or the sense of elation, and of liberation. A *unique event* had happened in the history of thought, one which could never be repeated: the first and final discovery of the absolute truth about the universe. An age-old dream had come true. Mankind had obtained *knowledge*, real, certain, indubitable, and demonstrable knowledge—divine *scientia* or *epistēmē*, and not merely *doxa*, human opinion.

Thus for Kant Newton's theory was simply true, and the belief in its truth remained unshaken for a century after Kant's death. Kant to the end accepted what he and everybody else took for a fact, the attainment of *scientia* or *epistēmē*. At first he accepted it without question. This state he called his 'dogmatic slumber.' He was roused from it by Hume.

Hume had taught that there could be no such thing as certain knowledge of universal laws, or *epistēmē;* that all we knew was obtained with the help of observation which could be only of singular (or particular) instances, so that all theoretical knowledge was uncertain. His arguments were convincing (and he was, of course, right). Yet there was a fact, or what appeared as a fact—Newton's attainment of *epistēmē*.

Hume roused Kant to the realization of the near absurdity of what he never doubted to be a fact. Here was a problem which could not be dismissed. How could a man have got hold of such knowledge? Knowledge which was general, precise, mathematical, demonstrable, and indubitable, like Euclidean geometry, and yet capable of giving a causal explanation of observed facts?

Thus arose the central problem of the *Critique:* 'How is

pure natural science possible?' By 'pure natural science'—*scientia, epistēmē*—Kant simply meant Newton's theory. (This he does not say, unfortunately; and I do not see how a student reading the first *Critique*, 1781 and 1787, could possibly find out. But that Kant has Newton's theory in mind is clear from the *Metaphysical Foundations of Natural Science*, 1786, where he gives an *a priori* deduction of Newton's theory; see especially the eight theorems of the Second Main Part, with its Additions, especially Addition 2, Note 1, paragraph 2. Kant relates Newton's theory, in the fifth paragraph of the final 'General Note on Phenomenology,' to the 'starry heavens.' It is also clear from the 'Conclusion' of the *Critique of Practical Reason*, 1788, where the appeal to the 'starry heavens' is explained, at the end of the second paragraph, by a reference to the *a priori* character of the new astronomy.)[61]

Although the *Critique* is badly written, and although bad grammar abounds in it, this problem was not a linguistic puzzle. *Here was knowledge. How could Newton ever attain it?* The question was inescapable.[62] But it was also insoluble. For the apparent fact of the attainment of *epistēmē* was no fact. As we now know, or believe we know, Newton's theory is no more than a marvellous *conjecture*, an astonishingly good approximation; unique indeed, but not as divine truth, only as a unique invention of a human genius; not *epistēmē*, but belonging to the realm of *doxa*. With this Kant's problem, 'How is pure natural science possible,' collapses, and the most disturbing of his perplexities disappears.

Kant's proposed solution of his insoluble problem con-

[61] In these lines Kant says of it (that is, of Newton's achievement) that it is 'an insight into the structure of the universe never to be changed in all time, and one which can look forward to its growth through the accumulation of observations, but need never fear a setback.'

[62] Poincaré was still greatly troubled by it in 1909.

sisted of what he proudly called his 'Copernican Revolution' of the problem of knowledge. Knowledge—*epistēmē*—was possible because we are not passive receptors of sense data, but their active digestors. By digesting and assimilating them we form and organize them into a Cosmos, the Universe of Nature. In this process we impose upon the material presented to our senses the mathematical laws which are part of our digestive and organizing mechanism. Thus our intellect does not discover universal laws in nature, but it prescribes its own laws and imposes them upon nature.

This theory is a strange mixture of absurdity and truth. It is as absurd as the mistaken problem it attempts to solve; for it proves too much, being designed to prove too much. According to Kant's theory, 'pure natural science' is not only *possible*; although he does not always realize this, it becomes, contrary to his intention, the *necessary result* of our mental outfit. For if the fact of our attainment of *epistēmē* can be explained at all by the fact that our intellect legislates for and imposes its own laws upon nature, then the first of these two facts cannot be contingent any more than the second.[63] Thus the problem is no longer how Newton could make his discovery but how everybody else could have failed to make it. How is it that our digestive mechanism did not work much earlier?

This is a patently absurd consequence of Kant's idea. But to dismiss it off-hand, and to dismiss his problem as a pseudo-problem, is not good enough. For we can find an element of truth in his idea (and a much needed correction of some Humean views) after reducing his problem to its proper dimensions. His question, we now know, or believe we know, should have

[63] A crucial requirement which any adequate theory of knowledge must satisfy is that it must not explain too much. Any non-historical theory explaining why a certain discovery had to be made must fail because it could not possibly explain why it was not made somewhat earlier.

been: 'How are successful conjectures possible?' And our answer, in the spirit of his Copernican Revolution, might, I suggest, be something like this: Because, as you said, we are not passive receptors of sense data, but active organisms. Because we react to our environment not always merely instinctively, but sometimes consciously and freely. Because we can invent myths, stories, theories; because we have a thirst for explanation, an insatiable curiosity, a wish to know. Because we not only invent stories and theories, but try them out and see whether they work and how they work. Because by a great effort, by trying hard and making many mistakes, we may sometimes, if we are lucky, succeed in hitting upon a story, an explanation, which 'saves the phenomena'; perhaps by making up a myth about 'invisibles,' such as atoms or gravitational forces, which explain the visible. Because knowledge is an adventure of ideas. These ideas, it is true, are produced by us, and not by the world around us; they are not merely the traces of repeated sensations or stimuli or what not; here you were right. But we are more active and free than even you believed; for similar observations or similar environmental situations do not, as your theory implied, produce similar explanations in different men. Nor is the fact that we create our theories, and that we attempt to impose them upon the world, an explanation of their success,[64] as you believed. For the overwhelming majority of our theories, of our freely invented ideas, are unsuccessful; they do not stand up to searching tests, and are discarded as falsified by experience. Only a very few of them succeed, for a time, in the competitive struggle for survival.[65]

[64] Applying note 63, no theory can explain why our search for explanatory theories is successful. Successful explanation must retain, on any valid theory, the probability zero, assuming that we measure this probability, approximately, by the ratio of the 'successful' explanatory hypotheses to all hypotheses which might be designed by man.

[65] The ideas of this 'answer' were elaborated in my *L.Sc.D.* (1935, 1959, and later editions).

XI

Few of Kant's successors appear ever to have understood clearly the precise problem-situation which gave rise to his work. There were two such problems for him: Newton's dynamics of the heavens, and the absolute standards of human brotherhood and justice to which the French revolutionaries appealed; or, as Kant puts it, 'the starry heavens above me, and the moral law within me.' But Kant's 'starry heavens' are seldom recognized for what they were: an allusion to Newton.[66] From Fichte onward,[67] many have copied Kant's 'method' and the difficult style of parts of his *Critique*. But most of these imitators, unaware of Kant's original interests and problems, busily tried either to tighten, or else to explain away, the Gordian knot in which Kant, through no fault of his own, had tied himself up.

We must beware of mistaking the well-nigh senseless and pointless subtleties of the imitators for the pressing and genuine problems of the pioneer. We should remember that his problem, although not an empirical one in the ordinary sense, nevertheless turned out, unexpectedly, to be in some sense factual (Kant called such facts 'transcendental'), since it arose from an apparent, but non-existent, instance of *scientia* or *epistēmē*. And we should, I submit, seriously consider the suggestion that Kant's answer, in spite of its partial absurdity, contained the nucleus of a true philosophy of science.

[66] See note 61 and text, above.

[67] Cf. my *Open Society*, note 58 to chap. 12.

H.-P. Stahl / Beginnings of propositional logic in Plato[1]

Method and ontology

We owe it to mathematical logic that it rediscovered the significance of the so-called "Stoic Logic," whereas the nineteenth century, following Kant,[2] had recognized Aristotelian syllo-

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[1] The following essay is a shortened and slightly changed version of the first part of my dissertation, *"Platons Hypothesis-Verfahren,"* Kiel, 1956.

[2] "It is further remarkable about it [logic] that between Aristotle's time and ours it has not been able to take a single step forward, and therefore it seems that it is in every aspect closed and completed" *(Critique of Pure Reason,* "Preface to the Second Edition," *Kr. d.r.V.* 2 Aufl., S. VIII).

gistic as the only genuine logic.[3] As against the Aristotelian logic of class or concept, Stoic logic is a sentential or propositional logic. In other words, the smallest units of Aristotelian logic are concepts (*A, B, C,* and so forth) which, connected by the copula "are" (or "is") are put in relation in judgments, according to their relationships of genus and species.[4] A syllogism is a matter of two judgments being put together in such a way that a third (the *demonstrandum*) follows from them necessarily. On the other hand, the elements of sentential logic consist of whole propositions (*p, q, r,* and so forth), which need not be restricted to judgments of the above-mentioned pattern. Logistic determines their possible relations to one another in a purely combinatory way ("both–and," "either–or," "if–then," and so on).[5]

One of the most important relations, that of implication ("if—then")[6] was thought to be *inter alia* the achievement of the Stoa, until B. Mates proved[7] that, among other Socratics who worked in the same line, the Megarics very early had even had a definition of implication. The following argument forms rest on implication: (1) $(p \rightarrow q) \cdot p, \therefore q$ (*modus ponens*—If the First, then the Second; now the First; therefore the Second), and (2) $(p \rightarrow q) \cdot \bar{q}, \therefore \bar{p}$ (*modus tollens*— . . . now *not* the Second; therefore *not* the First).

These forms, however, as will be shown, already lie at the basis of Plato's method of hypothesis, so that we not only can detect in this philosopher the beginnings of Aristotelian

[3] Cf. Bochenski, *Ancient Formal Logic* (Amsterdam, 1956), p. 7; J. Łukasiewicz, *Aristotle's Syllogistic* (Oxford, 1951), p. 49.

[4] It is apparent at first glance that this comes from Platonic *diairesis*.

[5] For a survey, see J. Mau, *Hermes*, LXXXV (1957), 153 f.

[6] Matrix 14 in Mau, *ibid.*

[7] *Stoic Logic*, "University of California Publications in Philosophy," Vol. XXVI (Berkeley, 1953); cf. Mau, p. 150.

syllogistic, but also of "Stoic logic"; even more: in Plato the method of hypothesis is already fully formed as a kind of argument theory, whereas in the direction of the logic of classes he gets only as far as *diairesis*.

The important role of the hypothetical method in Plato's philosophy was first stressed by the Marburg neo-Kantians. Here at least the names of Cohen, Hartmann, and Natorp should be mentioned. In their interpretations, hypothesis is always identified with Idea, and, in accordance with the neo-Kantian position, it is understood as the *Grundlegung* of thought and even as a fundamental principle of thought itself. It is clear that such interpretations sometimes force the historical Plato, since he does not believe that he is "positing" Ideas (or, "laying them down" [*legen*] as a "basis" [*Grund*]), but rather that he is finding them.

In more recent times, R. Robinson,[8] taking the evolutionist's view of logic as his starting point, brought up the discussion of hypothesis as an independent subject. The following essay owes a lot to this valuable book, but the answers to it that have been given so far[9] justify new studies on the subject.

My own interest was not directed only to logical theory and the program of hypothesis, but mainly to its execution and the way it is intertwined with the increasingly developing theory of Ideas. Therefore I have restricted myself to the dialogues *Meno* (introduction of the new theory), *Phaedo* (most

[8] *Plato's Earlier Dialectic* (Oxford, 1953; 2nd ed.).

[9] H. Cherniss, *American Journal of Philology*, LXVIII (1947), 133 ff.; P. Friedlaender, *Classical Philology*, XL (1945), 253; N. R. Murphy, *Classical Review*, LVI (1942), 119; M. D. C. Tait, "*The Phoenix Supplement*," I (1942), 110 ff. (*partim*); recently also: W. Bröcker, *Gnomon*, XXX (1958), 510 ff.

frequent application of it in connection with the Ideas), and *Republic* (recognition of the limitations of this method in relation to the Ideas), and have not included the *Parmenides*, which, after a criticism of the previous theory of Ideas, broadens the method and applies it to quite different realms.[10]

Meno

The subject of the *Meno* is first of all the question whether virtue is something teachable, or, more accurately, this is the subject that the Meno in the dialogue is interested in (70A1). His partner in the discussion, Socrates, however, wants first to get straight about what virtue itself is before answering this question (71A5–7), because only if you are clear about the What of a thing (*τί ἐστιν*) are you able to say anything about its quality (*ὁποῖον*) (71B4). This gives direction to the first part of the dialogue. Then—just as in the aporetic early dialogues—after a number of attempts at definition have failed, Meno comes up with a piece of Sophistic wisdom: it is senseless to look for something that you do not know (80D5–8). Socrates undermines this eristic position by the newly introduced theory of Anamnesis (81A5–85B7). This shows that it makes sense to go on inquiring. But Meno wants to see the question of the teachability of virtue discussed rather than that of the essence of virtue. Thus Socrates, apparently giving in, sees himself forced to combine both questions by an artful device, by being able to make the answer to Meno's question depend on a preliminary answer to Socrates' own question: this is where Plato

[10] I must here bypass the study of the words *ὑπόθεσις* (hypothesis) and *ὑποτίθεσθαι* (hypotithesthai); cf. my dissertation, 1 ff. and Robinson, *op. cit.*, pp. 93 ff.

introduces the method of hypothesis. I shall first present this difficult passage in translation: (86D8–87C9)[11]

> SOCRATES. . . . it seems we must inquire into the quality of something of which we don't yet know what it is. But grant me at least one small relaxation of your sway and allow me, in considering whether it can be taught, or whatever other way [scil. it comes into human beings' possession], to start inquiry from a hypothesis—the same way, procedure, I mean, in which geometers often make their inquiries. When they are asked, for example, about a given area, whether it is possible for this area to be inscribed as a triangle in a given circle,[12] they will probably reply: "I don't know yet whether it fulfills the conditions, but I think I have a hypothesis which will help us in the matter. It is this. If this area is such that, . . . then, I should say, one result follows; if not, the result is different. If you ask me, then, about the inscription of the figure in the circle—whether it is possible or not—I am ready to answer you in this hypothetical way."
>
> Let us do the same about virtue. Since we don't know what it is nor of which quality, let us make it a hypothesis and investigate whether it is teachable or not. We shall say: "If virtue is of which quality among things that belong to soul, is it teachable or not?" Well, in the first place, if it is of another kind than knowledge, is it then teachable or not? Or, in the language we used just now, can it be an object of Recollection? We needn't worry about which of the two names we are to give to the process, but simply ask: will it in this case be teachable? Or is at least this plain to everyone that a man is not taught anything except knowledge?
>
> MENO. That would be my view.

[11] With the omission of the well-known mathematical passage 87A4–6.

[12] For an interpretation of this passage see R. S. Bluck, *Plato's Meno* (Cambridge, 1961), Appendix, pp. 441–461.

SOCRATES. If, on the other hand, virtue is some sort of knowledge, clearly it could be taught.

MENO. Certainly.

SOCRATES. So that question is easily settled: I mean, being knowledge, virtue would be teachable, but being something else, it would not.

Let us first consider the geometrical example: the real question is that of the possibility of inscribing a certain geometrical area in a circle (86E6–7). It can only be answered "from a hypothesis" from which it is clear that the hypothesis must be the conditioning clause in the conditional whole that contains the condition for the realization of the possibility in question. The consequent sentence contains the problem under discussion (87A6–7). It is striking that at the same time it is stressed that the condition is true *exclusively:* if it is not fulfilled, then something else results. We shall come back to this later. The unmentioned object of the act of "hypothesizing" (ὑποθέμενος) (87A7) is therefore the geometrical description mentioned in 87A3–6. The question of the teachability of virtue is to be treated in the same way (οὕτω) (87B2): since we know neither its quiddity nor its quality, "it" should be made to be the hypothesis. From the context of the sentence 87B2–5, the "it" (αὐτό)[13] can only mean the question, what is it (ὅτι ἐστιν) and of what quality is it (ὁποῖόν τι). This however, contradicts (*a*) the previous statements of the dialogue, according to which (cf. 71B4; 81E2; 86E1!) the *quid* and the *quale* must be kept strictly separate, and (*b*) the required parallel with the geometrical example. Therefore, they cannot both become subjects of the hypothesis. In the same way, it is surprising that in the following (87B5) the conditional

[13] Cf. *Phaedo* 93C10; "that" (ἐκεῖνο) takes up again the hypothesis that "the soul is a harmony" (ψυχὴν ἁρμονίαν εἶναι) (C3).

clause asks for the quale (*hopoion ti*) and thus uses the term that really belongs to the teachability of virtue dealt with in the consequent. We can only call attention to the carelessness in the manner of expression, and we have to assume from the sequence of thought in the dialogue that the it (*auto*) 87B4 can only mean the answer to the question "What is it?" (*ti estin*).[14]

Moreover we can tell with certainty which the hypothesis is: it is the sentence "Virtue is knowledge." If we compare the conditional period 87B5–6 with that of C5–6 we see now, instead of the questioning *poion ti* of the first case, the same spot is filled with the word "knowledge" (*epistēmē*). We get another confirmation in 89C2–4; "It's clear, Socrates,—according to the hypothesis: if virtue is knowledge,—that it is teachable."[15]

Thus we have the following agreement with the geometrical example: the geometer takes as hypothesis a proposition about the given figure (conditional clause) and states the consequences about the possibility of inscribing it into the circle (consequent). Socrates expresses a proposition about virtue (conditional clause) and from it draws conclusions about its teachability (consequent).

The parallel is carried further: it is also true that the hypothesis set up by Socrates is the *exclusive* condition for the truth of the consequent. First, the negation of the condition brings with it the negation of the consequent (87B6–C3): if virtue is of some other kind than knowledge (= non-knowledge), then it is not teachable. Second, if, however, virtue is knowledge, it is obviously teachable (87C5–6). The two alternatives are set opposite to each other by *men* (B6) and *de* (C5), and are brought together at the end of the thought process (C8–9).

[14] Cf., however, 97B11, *hopoion ti;* probably the difficulty for Plato lies in the definition of the concept of substance.

[15] Cf. Cherniss, *op. cit.*, p. 140, n. 38; and Robinson, *op. cit.*, p. 117.

Thus the setting up of the hypothesis is finished and the necessary connection between the two sentences is ascertained.

Looked at from the point of view of present-day knowledge of logical laws, the circumstance that the truth of one sentence is the exclusive condition of the truth of the other one means a *mutual* implication of the two sentences, i.e., *equivalence*. The verification (or falsification) of one of the two sentences would mean the verification (or falsification) of the other sentence as well, so that we can invert the relation of the condition and the consequent at any time. (This inversion is actually done in 98D10–12.) Shown schematically, there are the following possibilities:

$$(1)\ \frac{p \Leftrightarrow q \quad p}{q} \qquad (2)\ \frac{p \Leftrightarrow q \quad \bar{p}}{\bar{q}} \qquad (3)\ \frac{p \Leftrightarrow q \quad q}{p} \qquad (4)\ \frac{p \Leftrightarrow q \quad \bar{q}}{\bar{p}}$$

Before we evaluate the schema, let us first follow the argument. What is now to be accomplished (*to de meta touto*, 87C11) is the proof of the hypothesis. Socrates begins it with the following words: Isn't it true, we say that virtue is good, and this hypothesis still remains: that it is good?

Here a difficulty arises: this hypothesis is neither (a) set up to solve a problem already at hand, nor (b) is the consequence shown that follows from its contradictory opposite. It seems to me that the most probable explanation of this crux, the existence of which cannot be denied, is that Plato in his subordinate proof is somewhat more lax in choosing his terms (we already saw something similar above in the introduction of the method of hypothesis). Here, too, he does not speak so entirely without justification: this hypothesis, too, gives an *implication*, namely the utility of virtue (87D8–E4), which serves as a foundation for the further course of the proof.

What appears in the following lines seems much more like

a hypothesis (87D4–8): "If there is any good distinct and separate from knowledge, virtue might not be knowledge" (denied hypothesis). "If, however, every good falls within knowledge, we would have been right to think it knowledge" (setting up of the affirmative connection of hypothesis and consequent). The truth of this "hypothesis" is now proved by induction after "good" has been set equal to "useful" (D8–E4), and that as much for external (87E5–88A5; 88D4–E2) as for internal goods (88A6–D3; summarized 88E4–89A1). With that, the consequent "Virtue is knowledge" would really be made certain; instead, however, Socrates now brings the argument into the (simpler) form of a syllogism (89A1–4; instead of *epistēmē* there is now *phronesis:* again an ambiguity in the terminology) without going back to the connection set up in 87D4–8.

With 89A the proof of the original hypothesis is finished. Meno says so in 89C2–4. From the point of view of the dialogue's content, both Socrates' question, "What is virtue?" and Meno's question, "Is virtue teachable?" have been answered. If we briefly sketch the course of the proof, we get the following schema:

(1) If virtue is knowledge, virtue is teachable (86C5)
(2) Virtue is knowledge (89A2–3)
---
(3) Virtue is teachable (89C2–4)

The subordinate proposition (2), the hypothesis, has been proved by a syllogism (89A1–3) whose first premise is again admitted as a hypothesis (87D3, cf. E1–3); the other one is got by *epagoge* (induction) (87E5–89A1).[16] The schema shows clearly that we have the recognized *modus ponens* argument form of *propositional* logic before us.[17]

[16] Cf. Robinson, *op. cit.*, p. 40.

[17] Robinson puts the end of the method of hypothesis in *Meno* here; but cf. the (even if wrong) attempt in K. Buchmann, *Philologus* Supplement, XXIX (1936), 74.

Meno is content for the time being and very surprised when Socrates still expresses doubts about the correctness of their results (89C5–D2). To this Socrates replies (89D3–4), that he does not take back "that it [virtue] is teachable if it is knowledge." That is to say, the necessary connection between hypothesis and consequent remains untouched. The mistake, rather, lies in the hypothesis itself, as Socrates hints (89D5–6). To prove that, however, he leaves the hypothesis and first turns to setting up a new context of condition and consequent (89D6–8): "if a thing is teachable—not only virtue—there must necessarily be teachers and students of that subject." In this the *consequent* (of the first hypothesis) in a universal form itself turns into a hypothesis from which follows necessarily (*anankaion*) a new consequent. I think the parallel position of 89D3–4 and D6–8 justifies our speaking here, too, of a hypothesis in Plato's sense. Here the hypothesis is no longer stressed as an *exclusive* condition, as it was in the previous cases (= mutual implication), but Socrates only assures himself that the negation of the consequent brings with it the negation of the antecedent (89E1–3).

From the logical point of view, this means that the complicated equivalence argument form is abandoned in favor of the simpler one of hypothetical syllogism with its two possibilities of *modus ponens* and *modus tollens* (*one-way* implication). From the above-mentioned possibilities (p. 187), therefore, (2) and (3) disappear in this case, and (1) and (4) remain—

$$(1)\ \frac{p \rightarrow q \quad p}{q} \qquad (4)\ \frac{p \rightarrow q \quad \bar{q}}{\bar{p}}$$

The whole passage following (89E6–96B), seen from the point of view of the main thought of the dialogue, serves only to refute (from experience) the conclusion derived from the new hypothesis.

After the required premise has been provided, the retrograde destruction of the first course of proof sets in: from the fact that there are no teachers or students of virtue (96c6 f.) it follows that it is not teachable (96c10), from which follows in turn that it is not knowledge. This last consequence is not drawn explicitly at once—because Meno, just as before, is interested in his own question, how men come to share in virtue (96d1–4)—but is shown immediately afterwards in the correction that the original hypothesis (Virtue is knowledge) has to undergo. This has proved to be wrong in its consequences, because the last consequence contradicts experience. Therefore, the hypothesis itself must now undergo an examination and correction. A short recapitulation of its proof brings to light the hidden flaw in it: that a good man is also a useful one remains (96e7; cf. 87e1–2); in the same way that only the one who leads correctly is useful (97a3–4; cf. 88a2–4; 88e1–2); it was false, however, that right leading depends only on knowledge (*phronesis*) (97a6–7; cf. 88d4–e3); this is shown by the example of the leader on the road to Larissa.

To correct this error a *distinction* is now made (that is why there is the reference to Socrates' alleged teacher Prodicus, that virtuoso in distinctions of words, 96d7): in the previous proof, it had been overlooked (*parelipomen*) (97b10) that besides knowledge, *right opinion*, too, "shows the way rightly."

The result—as negative as it may seem for Socrates' main question—is certified in the light of the distinction gained, in that the course of proof is briefly gone through again (98b–99c). The following points suffice for us:

(1) The original hypothesis and its consequent are mentioned (98d10) without the term "hypothesis" being mentioned. Immediately afterwards (e1), it is said by enumeration (connected with a mere "and") that, if there were teachers, it (virtue) would be teachable. In the parallelism of the two sentences I

see a confirmation of the fact that one can speak in the second case, too, of a hypothesis in Plato's sense (see above, p. 189).

(2) Plato obviously saw the relation of hypothesis and consequent as reversible (98D12; cf. D10). From the logical point of view, this means: for *him*, the way from *modus ponens* to *modus tollens* went only via the *equivalence* form, because only after the reversal of positions of hypothesis and consequent has been accomplished in the affirmative connection does he conclude from the negation of the (original) consequent the denial of the (original) hypothesis (99A7; this line goes with the thought of 98D12). In the same way, the denial of the second hypothesis (98E2) points again to equivalence, contrary to the immediate reversal in the sense of the one-way implication carried out in 89A1–3, as it would have been completely sufficient for the *modus tollens* applied. From the fact that Plato went the roundabout way via the equivalence form, it becomes very clear that he was by no means fully aware of the logical possibilities of his new method; it almost appears as if he sticks to a schema —of whatever kind—that requires of him the statement of a two-way implication.

With 99B the actual course of thought has come to its end. In a concluding observation, it is reflected on, whether, in cases of the statesmen who accomplish so much good without knowledge, but solely by *eudoxia* (right opinion) (99B11), one should not call them divine. For by *theia moira* (divine dispensation) (99E6) they get their ability. The actual desideratum, however, is in any case the knowing one: he would be, if there were one, like Homer's Teiresias among the shades (100A). On the basis of the discussion carried out, one has to say that virtue dwells in people by a divine dispensation, but we will know something clear about this only when we know *ti pot' estin arete* (what virtue is anyway) (100B). With that, even the result that has now been reached can be called debatable, and at the end the

question arises again with which *Socrates* began the discussion.

We have seen that the method of hypothesis is not restricted merely to the passages assumed by Robinson, but that it operates from its introduction to the end of the dialogue; even the original putting of the question at the beginning of the dialogue already leads to the hypothetical method directly after it leads into the bewilderment (*aporia*), which is familiar from the early dialogues. We can now present schematically the course of the method as it is practically carried out in the dialogue:

p = Virtue is knowledge.
q = Virtue is teachable.
r = there are teachers and learners of virtue.

I. (a) $\dfrac{p \rightarrow q \quad p}{q}$ (b) $\dfrac{q \rightarrow r \quad q}{r}$ (from Ia) } (*modus ponens*)

Now, however, r proves to be false, and the procedure is carried through backwards:

II. (a) $\dfrac{q \rightarrow r \quad \bar{r}}{\bar{q}}$ (b) $\dfrac{p \rightarrow q \quad \bar{q}}{\bar{p}}$ (from IIa) } (*modus tollens*)

In that Plato undoes the proof explicitly from the end—even though it is known *beforehand* where the mistake lies (89D5)—he lets the Socrates of the dialogue at the same time demonstrate something new: Here a method has been found that gives us the possibility of correcting *ourselves* in our own course of thinking. The mistake lies in the present case in the hypothesis; it is recognized and cleared up by distinguishing between knowledge and right opinion.

Having finished our interpretation of Plato's text, let us

now raise the question whether we can draw a connection with the help of the material here in the *Meno* to one of the methods of ancient mathematicians that has come down to us. In this, however, we depend completely on post-Platonic testimonies.

Several attempts have already been made to interpret the Platonic method of hypothesis in terms of the geometrical method of *Analysis*—which also operates by setting up a hypothesis. Robinson has most recently refuted this possibility.[18] But he himself seems to me to provide the basis for this possibility in an essay on analysis in Greek geometry.[19]

I start from the equivalence structure (two-way implication) that we noticed in Plato's form of proof and that seemed to hint at a certain "schema": Robinson shows that it is just this kind of two-way implication that characterizes analysis. Therewith he rehabilitates the standard scholarly view against the interpretation of Cornford,[20] who interprets the upward movement of the mind in *Republic* (511B, *inter alia*) through analysis, by seeing in analysis the finding (with the help of intuition) of conditions that imply the truth of the thing under discussion. In other words, Cornford sees in analysis only a *one-way* implication that runs from the intuitively found hypothesis to its consequent: $p \rightarrow q$.[21] This however is a relation that—as we have shown—Plato *does not start from* but that his method only *leads to*.

By a thorough new interpretation of a passage concerning analysis in Pappus,[22] Robinson shows clearly the Greek geometers' belief that in analysis (the way "upwards") as well as in

[18] *Op. cit.*, p. 121.

[19] MIND, XLV (1936), 464 ff.

[20] MIND, XLI (1932), 41 ff.; reprinted in *Studies in Plato's Metaphysics*, ed. R. E. Allen (New York, 1965), pp. 61 ff.

[21] *Op. cit.*, p. 67, n. 1.

[22] Fr. Hultsch (ed.), *Collectio* (Berlin, 1876–1878), pp. 634–636.

synthesis (the way "downwards")—the latter following the former but in the opposite direction—each step of the proof comes about as the logical consequence of its predecessor. We get the same picture from the solutions of geometrical problems that have come down to us.[23]

Thus we have a confirmation—independent of Plato's statement—that in Greek geometry a method was used that, along with the term "hypothesis," shows the same logical structure as that used by Plato in the *Meno*. From a report handed down by Proclus, we have reason to suppose that this procedure was used already in relatively early times. The report tells us that Plato himself had already transmitted this method to Leodamas.[24]

Besides the equivalence structure we have just dealt with, there is a further agreement between Plato's hypothetical method and the method of geometrical analysis. I quote Robinson's representation (altogether right) of the analytical method:[25]

> It consisted in hypothesizing the proposition to be proved and deducing consequences from that proposition until you reached a consequence which you knew independently to be true or false. . . .

This squares exactly with my schematic picture (p. 192): the proposition to be proved is "Virtue is knowledge" (p), the (final) consequent that proves to be false is "There are teachers

[23] Cf. Robinson's example, *op. cit.*, pp. 470 f. Oddly enough, Robinson does not use this aspect of the structure for further interpretation of the *Meno*, although his interpretation and his term "equivalent" (p. 116) suggest it formally.

[24] *Proclus: A Commentary on the First Book of Euclid's Elements*, trans. Glenn R. Morrow (Princeton, 1970), pp. 165–166 (Friedlein, pp. 211 f.).

[25] *Op. cit.*, p. 121.

of virtue" (*r*). Robinson blocks his way to my interpretation by writing:[26]

> . . . since the question is whether virtue is teachable, the method of Analysis would begin by assuming that virtue is teachable and draw conclusions therefrom. Other things being equal, it might be possible to hold that this is how Socrates does begin in the *Meno*, and that the first consequence he draws is that virtue is knowledge; but it is not possible to hold that he goes on to infer something from virtue's being knowledge. . . .

It is clear: Robinson does not interpret the hypothetical method from the entirety of the dialogue but only from this passage where the method is introduced. Only so can he come to the supposition that the first question is about the teachability of virtue and the first consequent its being knowledge, whereas in reality the course of proof goes the other way.

From the passage quoted it is clear that, seen from the question that Meno is interested in, the original hypothesis has the status of a premise, but that, from Socrates' point of view, it is the *demonstrandum* (or *refutandum*). That is, here two important aspects are to be distinguished:

(1) From the point of view of the dialogue's basic problem (What is Virtue?) the argument follows exactly the method of analysis—the one described by Robinson that was handed down to us by later mathematicians; the problem *itself* is made to be the hypothesis and is tested by its consequences.

(2) From the point of view of Meno's question, the problem becomes the *consequent* of the hypothesis, and the hypothesis is only proved for the sake of its consequent. It is in this sense that Socrates, who pretends to meet Meno's insistence on answering his own question, lets his geometer speak (87A1 ff.).

[26] *Loc. cit.*

From this point of view then, Plato's method differs from the solutions of geometrical problems handed down to us.

The distinctively new achievement of the dialogue probably lies in that Plato knows how to make use of a method that, according to his own testimony, he took from the geometers, for his urgent problem of virtue, to which he had already dedicated several dialogues; he sees that the method of mathematics most of all does justice to his claims for *certain* knowledge. Thereby it becomes apparent to him that a logical method that is ordinary in a certain field is *not* bound to its special content but *can be detached* and can be applied to contents of quite different kinds.

And by using the new method of proof he takes, without knowing it, one step further: in his hands, the method broadens from the narrower sphere of application of the equivalence form into the argument form which is much easier to use and much more convenient to his needs and which we nowadays refer to as *modus ponens* and *modus tollens*.

The goal to be reached by the new method is the *Idea*. Neo-Kantianism has made it plain to us that in the *Meno* the problem of the a priori is touched on for the first time. Natorp went so far as to claim that Anamnesis in the *Meno* in every case is pointed to such objects of knowledge as are capable of a "pure" (in the Kantian sense) rational accounting.[27] That this claims too much is directly evident from *Meno* 81c5 ff. alone, where it is said that the soul has seen "all things" prenatally; that is, Plato here gives no restriction to the effect that only certain objects of knowledge—of whatever kind—are accessible to the soul through Anamnesis (cf. D1, D3, 85D2–3).

It is possible, however, for us to conclude that, when "all things" are spoken of, the Ideas are meant to be included. And

[27] *Platons Ideenlehre* (Leipzig, 1921; 2nd ed.), p. 35.

this is of interest for us. Let me call attention to the further point that the things known by the soul in Anamnesis are what they are in an *objective* interrelation, which the soul, beginning from individual points already known, tries to get hold of systematically in *anamnesis* (all nature being akin: τῆς φύσεως ἁπάσης συγγενοῦς οὔσης) (81C9–D1, cf. D2–3). This stock of objective givens is also the presupposition for the following discussion, in which Socrates, on the basis supplied by the Anamnesis myth that he is trusting in, wants to inquire systematically into the question "What is Virtue?" (81E1–2). But the *ti estin* (τί ἐστιν) is, as we know, the inquiry into the Idea.[28] It is never questioned, as is clear from the whole first part of the dialogue, whether the Idea *exists at all;* rather the question is only, How do I find the Idea? How can I answer the question *ti estin arete* (τί ἐστιν ἀρετή;)?

And it is exactly to the answering of this question that the method of hypothesis in 86E ff. leads, so that we can establish a tight connection between the doctrine of hypothesis and that of Ideas in the *Meno.* Since, first of all, the Idea—like all objects of *anamnesis*—is presupposed in its objective existence, and since, further, the method of hypothesis aims at answering the question posed by the inquiry into the Idea, therefore the task of the new method in *Meno* consists essentially in finding *an access to the Idea,* in specific, the Idea of Virtue. Now, in fact, the effort is not yet successful—to get a firm ("tethered") hold on the essence of Virtue. But a positive result is nonetheless achieved: it has been shown that further inquiry makes sense in principle, and a method has been found that encourages one to make another beginning.

28 For details, see my dissertation, pp. 26 ff.

Malcolm Brown / Plato disapproves of the slave-boy's answer

The *Meno* is an inquiry about virtue, but it is something more than that; it combines an inquiry about virtue with the more fundamental discussion of how to inquire properly. On the principal question the dialogue comes to an unsuccessful (aporetic) result, but its very failure contributes to the conclusion Plato draws[1] about inquiry itself. The rule is: unless it preserves the distinction between fundamental questions and

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[1] I will not make any attempt here to separate the distinctively platonic from the indifferently platonic-socratic components of the dialogue, but will only bring up the question in connection with some of the evidences of Plato's contacts with mathematicians of his day.

derivative questions, always attacking the fundamental ones first, any inquiry will end in confusion.

As with the dialogue, so with the slave-boy episode within it, two questions are handled, one of them substantive, the other a question of method. The substantive question is how to double the square of a side of 2 units; the procedural question is how, if at all, can an answer be found by one who does not know it. It develops that the answer must be sought exclusively among opinions which the boy already holds, by means of questioning. What I want to argue is that the boy's lesson is not an unqualified success any more than is Meno's. I shall maintain that, exactly parallel to the main discussion, Plato means to cast suspicion on the answer which Socrates and the boy arrive at, and for an exactly parallel reason: the inquiry has been conducted improperly. On the other hand the lesson is far from an unqualified failure, since despite its lack of substantive result, it contains an important message about method. Just as it becomes clear in the discussion with Meno that any disciplined inquiry into virtue must refrain from asking what virtue is like (the ὁποῖον) until it has settled the more fundamental question of what virtue itself is (the ὅ τι), so in the slave-boy passage it is learned that we must refrain from asking what the solution to our problem is like until we have settled on what the solution itself is.

I shall argue that the mathematics of the slave-boy passage is not of one kind only but of two kinds, namely, arithmetical and geometrical. And at least in the case of the sort of geometry represented here, geometry and arithmetic stand for importantly different things in Plato's mind.[2] Arithmetic is for him a

[2] We owe it mainly to German scholars, and especially to those who have made a study of Greek mathematics, that we are aware of the distinction between arithmetic and geometry as Plato saw it. O. Toeplitz is charac-

model of a rigorous science, a science on secure foundations, whereas geometry models a near-science, a science still insecure in its foundations. Therefore what Plato is able to do in this passage—and what I shall argue he is principally doing—is to present a model inquiry in two parts, in the first part of which the inquiry remains rigorous but can produce no substantive answer, and in the second part gets an answer at the cost of rigor. Putting the point in terms of the actual mathematical problem, I am saying that the answer to the problem of doubling the square which the boy finds, insofar as it is geometrical in type, represents an inferior grade of knowledge when the problematic status of geometry's foundations has been allowed for. Insofar as the questions and answers had remained arithmetical in form, it is a superior grade of knowledge that was at least aimed at; and it takes nothing away from this epistemological ideal that the boy's lesson as a whole does not satisfy its demands. If my reading is correct, the learning experiment reinforces a major point in the dialogue as a whole: that no inquiry should rely much on its conclusions about anything—whether it be the length of a line or the qualities of virtue—if it has not identified in advance what it is talking about. That is, it should not rely on such conclusions unless it insists upon ignoring the good example of the arithmeticians* and following the bad example of certain geometers.

For the sake of clarity, I shall separate two parts of my

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teristic, as is his observation: "*Von vornherein konnte kein Zweifel darüber bestehen, dass Plato das Problem vom Verhältnis der Arithmetik zur Geometrie ernstlich angegriffen hat*" ("Das Verhältnis von Mathematik und Ideenlehre bei Plato," *Quellen und Studien zur Geschichte der Mathematik* [Berlin, 1931], p. 4).

* [It has been objected to my interpretation that it leaves no room for Recollection. But Arithmetic provides the room: everything reckonable is recollectable. It is only the unreckonable, or a certain way of mishandling it, that does not meet Plato's requirements.]

conclusion about the slave-boy passage: (1) that Socrates conducts the lesson in two distinct parts, the first arithmetical and the second geometrical and (2) that the geometrical part is platonically suspect. In the first section I shall argue the first point, supporting it exclusively from the text of the slave-boy passage. The second point, which I shall argue in section II, will have to depend not only on this passage but on evidences from other platonic dialogues. I shall assemble the remaining evidences, chiefly reports about Archytas and Plato, in section III. Finally, in section IV, I shall outline some evidences drawn from the history of mathematics which tend to support my conclusion as a whole.

I

What are the evidences in the slave-boy passage of the distinction between the arithmetical and geometrical parts of the lesson? In the first place, Socrates does not take as given simply "a square," but rather a square "whose side is 2 feet" (*αὕτη ἡ πλευρὰ δυοῖν ποδοῖν*) (82c). Thus he has identified the side-length of the given square arithmetically.[3] He then gets the boy to see that since a square two feet on a side will certainly contain four square feet, and since it is required that they double the given area, the required area must contain eight square feet. That is, before he even asks the boy for his first conjecture (opinion) about the answer to the problem, he has cast both the given and the thing sought into arithmetical form. In this form the ques-

[3] At the end of the lesson, the boy decides (with Socrates' help) that the given square is doubled by the square on its diagonal. That the given square has a side length of 2 units is irrelevant to this conclusion. The number of units in the side is relevant only to the arithmetical part of the lesson.

tion becomes: what is the length of the side of the 8 foot square? The form in which Socrates asks the question is distinctive: he asks in the *ti esti* form, implying that he wants a number for an answer. The implied requirement that the answer be a number stands out clearly in the form of the question as it first occurs. Socrates leads with the suggestion: "This side is 2, what is the side (πηλίκη τις ἔσται) (82D) of the doubled figure?" When Socrates repeats his question the form is the same (πηλίκην τινα . . . εἶναι) (83E).* In both cases the boy is made to respond with numerical answers: in the first case he answers "4," and in the second case "3." Each of these answers is refuted, and again in the form of the refutations the argument is arithmetical. Socrates points out that if "4" is the right answer, then 4 equals 2; if "3" is correct, then 9 equals 8. After these two numerical estimates and their respective numerical refutations by *reductio ad absurdum* arguments, the boy gives up in exasperation just as Meno had given up before him; they are both exasperated, or numbed, by the recognition that so long as they give answers to Socrates' questions in the form he insists upon (the *ti esti*) each answer is open to decisive objections.

After the interruption in the lesson occasioned by the *aporia* of the boy, Socrates begins the argument again from the beginning. Nothing of the argument in the second part depends upon anything in the argument of the first part. This logical independence of the second part derives in part from the fact

* [I have been challenged on the point that these two occurrences of *ti*'s are indefinite and therefore only hang onto the interrogative word before them. Thus they are strictly *pēlike ti* in form, not *ti* (how much of a thing, not what thing). The one at 82D8 is followed immediately (without the boy's giving an answer) by a simple *ti* (82E1), so that seems to me a defensible case of *ti*-form. The other is not reinforced that way, so I must give it up and weaken that much my argument from the *ti*'s.]

that Socrates' questioning is in a wholly new form. He now asks the boy to indicate what the required line is like. He puts his principal question in terms of *poion* (85B1) instead of *ti*. The *ti*-form of questioning does not reappear at all in the second part of the lesson except where he gets no answer or elicits answers of arithmetical form in calculations subordinate to the principal argument (thus the answers "I don't understand" and "twice" in 85A, and "eight feet" in 85B1). The *poion*-form, on the other hand, had not appeared in the earlier part except where no answer from the boy was possible (at 82E when Socrates is talking to Meno, and at 83C where he does not permit the boy to answer). Thus those questions with which Socrates elicits answers to the main question (what size must the required line be?) are exclusively *ti*-form before the interruption, and exclusively *poion*-form after it. Moreover when the *poion*-form is first introduced, it is brought into explicit contrast with the arithmetical form of all of the previous questions: "If you don't want to count, at least point to the sort of line" (εἰ μὴ βούλει ἀριθμεῖν, ἀλλὰ δεῖξον ἀπὸ ποίας [γραμμῆς]) (84A1).[4] This is a command with several important implications, two of which are relevant to the point I am now making. These are (1) that counting, the fundamental arithmetical operation, is contrasted with pointing to a line and (2) that counting, which had been the appropriate response to a *ti esti* question, is contrasted with the pointing out of something in the diagram, as a response to a *poion*.[5]* It is precisely at this line of the dialogue,

[4] Gustav Junge has supplied an excellent free translation of this line in his article "Von Hippasus bis Philolaus" in *Classica et Mediaevalia*, XIX, p. 46: "*Wenn es mit Zahlen nicht geht, dann vielleicht durch Zeichnung.*" His comment is also noteworthy: "*Offenbar wird auf die Unmessbarkeit von Seite und Diagonale angespielt*" (*ibid.*).

[5] It is a curious point about Plato's own summary of the slave-boy passage in *Phaedo* 73AB that the lesson is sharply divided into an "asking and answering questions" part and a part "based on diagrams." It is true

even more precisely at the *alla* of it, that the course of the lesson takes a sudden turn. At the moment I am only concerned to show that it is a turn away from arithmetic and toward a species of geometry.

The independence of the second part of the lesson derives also from its starting point. Socrates initiates the second part of the lesson by drawing a new figure (84D–85A) in which the shift from arithmetic to geometry is made clear. For in the new diagram Socrates omits the construction of the unit lengths, which construction he had in fact done in the first part of the lesson (at 82c3 f.), and which units are unconditionally necessary for the counting which had followed. Given the new diagram, counting of lengths is no longer possible for the simple reason that Socrates has avoided constructing the necessary basis for it, namely, units of length. The new diagram is also significantly different in that a new sort of line has appeared in it: the sort which is "stretched from corner to corner" (84E5). It is noteworthy that nothing is said, either at the time of their being drawn in or later, about the *length* of these diagonals;[6] all that is said is what they are like, namely, angle-to-angle. This is to leave open the question of the *ti esti*, or their arithmetical identity, but to ascribe to them a *poion*, a geometrical description.

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that in the arithmetical part of the argument, the diagrams could have been eliminated without essential loss (the numbers suffice), and that in the geometrical part, they cannot.

* [See Burnet's note to *Phaedo* 73A7, in which he argues convincingly that the slave-boy's lesson, so far as it bears on 'diagrams,' is being depreciated, "opposed to, rather than included in, the process καλῶς ἐρωτᾶν (good inquiry)" *Phaedo* (1911), *ad loc.*]

[6] As I shall argue later, nothing *can* be said about their length in terms of the units of length which have been taken as given, and which, if taken seriously, impose limiting conditions on the expressibility of the answer to the problem as a whole. This is what is meant by saying that, in relation to its side, a given square's diagonal is irrational.

Confirming evidence of the point I am making occurs at 85A. Socrates there asks the boy if the diagonals he has drawn are equal. The boy answers that they are.[7] How can the boy have known that they are equal? Not by means of a whole number or rational number calculation (which he is capable of), for in this particular problem this is logically impossible, for a slave or anyone else.[8] Nor by any other sort of numerical calculation, since the Greeks did not recognize what we now call quadratic irrationals as numbers properly so called. Therefore, every arithmetical argument which could have been known to Plato for the equality of these particular diagonals is necessarily excluded. The remaining possibility is a geometrical argument; for example, the certainly familiar one from the ancient congruence theorem preserved for us in Euclid I, 4. Therefore the step at 85A, which is necessary to the argument of the second part, itself requires support which must be of a geometrical, not an arithmetical form.

I take the above arguments to be sufficient to establish the first part of my conclusion about the slave-boy passage; namely, that in its second part it represents a new argument, which is distinctively geometrical in form, whereas the first had been distinctively arithmetical. As I now proceed to argue that the geometry which is here practiced is implicitly condemned by Plato, I shall want to avoid making any suggestion

[7] There is a peculiarity about the form of his answer here which suggests that his assent may be less than wholehearted. I shall pass this by here and return to it in the next section.

[8] That this problem is strictly insoluble arithmetically is referred to as a familiar fact by Aristotle in *Prior Analytics* 41[a] 26–30. A theorem is on record from Archytas which also, independently of the one quoted by Aristotle, has the same consequence for the slave-boy problem. I shall discuss this theorem in section III below. The only point required here is that Plato must have been familiar with the elementary fact about the technical difficulties (for the arithmetician) implied in this problem.

that Plato is condemning geometry as a whole. I will therefore avoid referring to the latter half of the slave-boy experiment under the title "the geometrical part," and will refer to it as Expt. II. The first part I shall call Expt. I. If the following argument is sufficient, the second part will have been shown not to deserve the title of geometry, insofar as this latter is understood to be a mathematical science. What I am proposing to show is that Plato presents Expt. II critically, as a sophistical counterfeit of geometry, a kind of ocular geometry. My conclusion is perfectly consistent, however, with the idea that, so far from rejecting geometry as a whole, Plato is implying that a truly mathematical form of geometry is well worth searching for, and well worth distinguishing from its counterfeit, ocular geometry.*

II

The clearest textual indication of Plato's intent to present Expt. II critically is contained in the already mentioned line εἰ μὴ βούλει

* [I had not seen Vlastos' paper "*Anamnesis* in the *Meno*" (*Dialogue*, September 1965) when I submitted my paper to *Review of Metaphysics*. To refute the suspicion that the mathematics is not rigorous, Vlastos suggests an experiment: substitute a strict argument (working either with foundations of arithmetic or the calculus of relations) for the one in Plato's text, and see if it makes any difference (p. 146). He finds the result of this "scissors-and-paste" operation a success: one would only need to amend later references (85E) to "doing geometry" and "geometry" (p. 146, n. 4). Now on Vlastos' assumption about geometry as "the firmly deductive discipline it had already become" (p. 152), these would seem minor amendments. But I am still convinced by the arguments below (and reinforced by the extra one above, Introduction, pp. xvi–xviii) that that assumption is wrong. These arguments make a reasonably strong case for the contrary conclusion: that geometry was quite infirm in Plato's middle years and in need of the criticisms he aimed at it then, for example in the *Meno*.]

ἀριθμεῖν, ἀλλὰ δεῖξον . . . The key word is "alla." When *alla* is used to introduce the apodosis of a conditional sentence in which a command is expressed, and when the protasis is negative, it has a very pointed meaning. In a general way it implies a break in thought between protasis and apodosis. But more precisely it means that "the apodosis contains a more or less inadequate substitute for what is left unrealized in the protasis: 'at all events,' with a notion of *pis aller*."[9] Thus the *alla* of Plato's 84A already brands the "deiktic" procedure which Socrates and the boy now turn to as inferior to the counting procedure of Expt. I, which better alternative they now abandon.

Is there some reason given in the dialogue, implicitly or explicitly, why Expt. II ought to be counted inferior to the first part?

In the first place let us consider the implications of the *poion*, which appears here in the apodosis (ἀλλὰ δεῖξον ἀπὸ ποίας [γραμμῆς]), and is for the first time a question directed at the boy. This form of question suggests that Expt. II will suffer from the very defect which will cause the failure of part II of the discussion about virtue: it will substitute a derivative (*poion*) question for a fundamental (*ti*) question. For when Socrates proposes to the boy that the *ti* question be put aside unanswered so that the *poion* may be taken up, he is operating in flat contradiction to the rule which he himself had enunciated in 71B. This is the same rule which he is about to reiterate (86DE), and the abandonment of which he is to lament at the end of the dialogue (100B). The whole discussion in the dialogue has been unclear, Socrates explains, because the participants in it failed

[9] J. D. Denniston, *The Greek Particles*, 2nd edition (Oxford, 1954), p. 12. Denniston illustrates this meaning of *alla* with a variety of passages from Plato and other 4th-century writers. One such passage is *Meno* 86E, where the *alla* has a precisely parallel meaning and use. I shall return to this parallelism, which I believe is far more significant than just a philological peculiarity of this use of *alla*.

to follow that rule about subordinating *poion*-form questions to *ti*-form questions. If indeed the *poion*[10] is any clue to the reason why Plato is depreciating Expt. II, the dialogue as a whole supplies ample evidence of what that reason must be: in Expt. II, as in the late part of the dialogue, the cardinal point of method expressed by the dialogue as a whole will be neglected.

The appearance of the *poion* here in 84A is all the more significant because, as I pointed out in the previous section, it becomes the exclusive form of Socrates' question (the *main* question) to the boy from this point on to the end of Expt. II. But its significance is further reinforced by the exact parallel between the passage just discussed and the one soon to follow, at 86DE. In the latter passage Socrates has just protested that if he had his own way, he would insist that he and Meno postpone any discussion of the derivative questions about virtue (whether it is teachable, for example) until after they had settled on what virtue is itself. But he reconciles himself to the fact that it is Meno who, unable to control himself, is nevertheless controlling the course of the discussion, so that Socrates will be forcibly led away from the fundamental *ti esti* question in the direction of the *poion ti:* ἔοικεν οὖν σκεπτέον εἶναι ποῖόν τί ἐστιν ὃ μήπω ἴσμεν ὅτι ἐστίν (86DE). Then comes the precise parallel with the passage of two pages previous in the slave-boy episode: Socrates says that if Meno will not inquire in a disciplined way, at all events (*alla*) he must relax his tyranny and permit some reasoning of a tentative kind, the characteristic of which is simply to assume an answer to the *ti esti* question and then to proceed (in the manner of the geometers) to a *poion* question. This procedure turns out to be essentially the same as

[10] E. S. Thompson and R. S. Bluck have both tried to "explain away" the *poion*. But this only serves to confuse Expt. I and Expt. II, which on this and other grounds are shown to be importantly different.

that of Expt. II, in that leaving a fundamental question only hypothetically answered, like leaving it unanswered, can only lead one to a result which is not thoroughly clear.[11] Thus the decisive turn in the dialogue away from the question of what virtue is, together with the result to which this turn leads, sheds some light on the second part of the slave-boy experiment which is a model of the dialogue as a whole: it supports the conclusion that Expt. II does not exhibit real learning.

Now I must pause to anticipate an objection to my foregoing argument. It may be objected that I am arguing in a circle when I attempt to clarify the slave-boy argument by means of the argument about virtue. For is it not my main intent to clarify the latter by means of the former? Indeed it is. But the circularity in which I am admittedly involved would only be vicious if there were no other, independent sources to draw upon for making the slave-boy passage clear. But there are other

[11] Socrates does indeed draw a conclusion "on the basis of the present argument" about what virtue is like, and in particular how it comes to men: it comes as a gift from the gods (100B). But he makes it clear that he is not nearly so interested in drawing consequences from a given argument as he is in making sure that the argument itself is sound. For he continues by saying that we "will first get clear on this matter" (*τὸ δὲ σαφές περὶ αὐτοῦ*) when we have put first things first: the what-is-it before the how-does-it-happen? Those who are careless about the order of their inquiries, and are over-eager to obtain "results" from their arguments may make the pretense of being on the frontiers of knowledge even though they remain ignorant about some central questions. But this ignorance when exposed socratically will undermine all of their pretensions to "progress" and leave them in the position of mere Sophists. Wittgenstein is formulating essentially the same distinction when he distinguishes that spirit which "expresses itself in a progress, a building of ever larger and more complex structures" from the other spirit which "strives for clarity and transparency of every possible structure" ("Vorwort," *Philosophische Bemerkungen*, ed. R. Rhees [Oxford, 1964]). He further characterizes the distinction as one between research "at the center, into essence (Wesen)" and research "at the periphery." Wittgenstein at that time (1930) associated himself with the essence-seeking, Socratic spirit.

sources, as I will try to make plain in parts III and IV below. Meanwhile it may have been harmless to reason from what is clearer in relation to my present argument and to promise at the end to reason only from what is clearer *simpliciter*.

There are three further indications from the text of the slave-boy passage, and in particular from that of Expt. II, which also lead to the same conclusion. One occurs at the beginning, where Socrates is constructing the new figure, another is in the middle, where the argument is in process, and the third occurs at the end, where the conclusion is formulated. I shall take them up in order. When Socrates begins to draw the new figure at 84D he asks the boy, "Is this not our four-foot square?" (ἡμῖν ἔστι). It is the ἡμῖν which is noteworthy. It introduces a relativizing suggestion, to the effect that it makes some difference whether the square in question is sensibly present to the men working out the argument. Such a consideration is foreign to the mathematical argument as such; "the square itself" is what is being argued about, not this or that square, or a square "present to us."[12] In the course of making the same drawing Socrates indulges in other language of doubtful mathematical purity. After he has placed three squares about a common point he asks: "Then we can fill in this one in the corner?" (προσαναπληρωσαίμεθα). Here again, an undue amount of the imagery of the moving and the visible order is introduced, and the mathematical purity of the lesson is compromised.[13] Is it

[12] Plato makes exactly this point with exactly the example here under discussion, the square and its diagonal, when he writes in *Republic* 510D "they [geometers] form their arguments about the square itself and the diagonal itself, and not about the one which they draw."

[13] Here too one need not appeal to any extra-platonic standards of mathematical purity to justify the raising of this doubt. Again Plato's own standards, as expressed in the nearby dialogue *Republic*, are at hand. There he criticizes certain geometers, saying (527A): "Their language is most ludicrous . . . for they speak as if they were doing something and as

possible to discount these evidences of Socrates' downgrading the argument to a non-mathematical level? They could be discounted, for example, as merely Socrates' efforts to make the problem more accessible to the slave-boy, to whom the language of "practical action" is more familiar. But if this were Socrates' reason for introducing the mathematically inappropriate language, how are we to account for the absence of any such language in Expt. I, where the boy was presumably on equally unfamiliar ground? The fact is, however, that these casual locutions first occur in Expt. II.*

The second textual evidence is one which was mentioned briefly in section I above: the assertion by Socrates that "the diagonals are [γίγνονται] equal" (85A), and the boy's reply that "they are" (Γίγνονται γάρ). One might quite rightly pass over the peculiar language of this exchange between Socrates and the boy if it were not for an arresting fact about the logical status of this step in the argument. The fact is that it is an assertion which needs the support of an argument, but for which no argument is given.[14] We are entitled, then, to pause with this part of the argument and study the exact way in which it is

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if their words were directed toward action. For all their talk is of 'squaring' and 'applying' and 'adding' and the like." If we are to think of a geometer's "adding" as ludicrously suggestive of an action, what are we to think of his offering to pour a square into a corner so as to fill it up? Plato's point in the *Republic* is that the true mathematician operates only for knowledge (γνώσεως ἕνεκα), never to "get something done."

* [Professors Guthrie and Kristeller have persuaded me that these efforts to find "hints" of criticism in various touches of language (*hēmin, anaplēroō*) are over-ingenious. "The fact is that in what you call Expt. I, S. does talk all the time on the level of the slave's understanding, whether or not he needs to make use of such casual expressions to do so." I now find this argument of Guthrie (in a letter in 1968) more persuasive than my own here.]

14 This logical omission was noticed by E. S. Thompson in his edition of the dialogue: *Plato's Meno* (Cambridge, 1901), *ad loc.*

formulated. The first thing that deserves notice is that Socrates' way of expressing the equality of the sides of the square diverges from the pattern he had established in Expt. I for expressing the same thing. At 82C, where Socrates was explaining that the given square has (ἔχον) equal sides, and again at 82D, where he explains that the figure sought also must be the sort that has (ἔχον) equal sides, nothing is said or implied about the sides "becoming" equal. If anything, the contrary is implied when Socrates gets the boy to count the units in each side of the given square, and shows him that there *are* two units in each side. Here in Expt. II, however, not only does Socrates change the expression to γίγνονται, but the boy answers in such a way as to emphasize the word. It is the boy's form of response including as it does a special and specially platonic[15] use of the particle γάρ that deserves attention.

When Plato puts into the mouth of a responder just a single word which he is "echoing" from a question together with the particle γάρ, he habitually means to have that responder do more than merely echo the word. He means that the responder is at least aware of, and often that he is even somewhat sensitive about, the particular way in which the question has been put. Its occurrence marks an answer which is guarded, or qualified, or even ironic. The suggestion is roughly: "It's your word, not mine." For example when Socrates explains in *Republic* 397D that the music he proposes to suppress will be exactly what children and servants think the sweetest (ἥδιστος), Adeimantus replies, ἥδιστος γάρ. But clearly he means to assent only on behalf of the children and servants, not simply, and not on his own part. A. D. Lindsay's translation, "Popular it may

[15] J. D. Denniston has found the "echoing" γάρ "very frequently in Plato, sometimes in the socratic works of Xenophon, and occasionally elsewhere" (Denniston, *op. cit.*, p. 88).

be," renders it exactly. It is the same with Euthyphro when he echoes Socrates' εἴρηται after Socrates lays down the premise "It is told that the gods disagree." Euthyphro piously echoes (7B): "That story is *told*, yes," obviously wanting to assent only to the telling, not to the truth of what is told.[16] The same observation is true of every occurrence of the "echoing" γάρ in the dialogues up to and including the *Republic*.[17] If one construes the present passage with the help of these parallel passages, the meaning of the boy's answer is roughly "well the lines *become* equal anyway."[18]

But is it not extravagant to construe the boy's answer as

[16] One need not suppose in Euthyphro any unbelievably great sophistication, nor any power of foreseeing Plato's own attack on the poets, to ascribe to him the view that such stories, although told, are neither true nor pious. Xenophanes had made the observation, and had made it well known, that "Homer and Hesiod have ascribed to the gods all deeds that among men are a disgrace: thieving, adultery, and mutual deception" (fr. 11).

[17] All told, there are ten such "echoing" uses of γάρ listed by Denniston. He cites *Charmides* 164A, 168A; *Euthyphro* 7B; *Phaedo* 90B and *Republic* 353E, 376B, 397D, 432D, 445E and 502B in addition to *Meno* 85A, the passage here in question.

[18] It is noteworthy that the archetypal MSS, B, T and W omit the γάρ from the boy's answer. John Burnet, however—and Bluck follows him—includes the γάρ on the strength of the MS authority of *Vindobonensis* 55 (F). Burnet argued ("A Neglected MS of Plato," *Classical Review* [1902], pp. 98 ff.) that F is derived "from an archetype of greater antiquity than any extant Platonic MS." He also pointed out that the few obvious errors in F were of the kind which were accountable to "ignorance, not a perverse ingenuity." Indeed it must be conceded that, from a literary point of view, there is something odd about Plato's putting into the mouth of the boy a specially platonic idiom, the suggestion of which is that the slave must be sensitive to a point as rarified as the metaphysical overtones of the word γίγνομαι. But it is a literary oddity which, according to the best extant text, Plato himself perpetrated. The fact that more learned editors tended to omit the γάρ, and that it has been restored first in our own century, only makes it more worthy of notice.

expressing some consciousness on his part of a logical or ontological distinction between γίγνεσθαι and εἶναι, or γένεσις and οὐσία? I answer that in one way it is indeed extravagant, but in another way not. If it is taken to imply that the boy must have been educated in the way of Parmenides and Zeno, it is admittedly extravagant. It is one of the givens that the boy has no learning to speak of. It would be extravagant to suppose that Meno himself knew that much philosophy. If we can trust Aristotle's report about Socrates, a distinction with such a "transcendent" basis might be too rarified for even Socrates to have troubled himself about.[19] But we are not forced to see anything Eleatic behind the boy's *Gignontai gar*, even if, as I am suggesting, we take it to be implying a discrimination between *gignesthai* and *einai*. There is another alternative, which is not only possible, but has something positive to recommend it. The alternative is to see Gorgias behind the scenes, and in particular the gorgianic treatise, *On Nature, Or That Which Is Not*. Plato made it clear at the beginning of the dialogue, and reminds us at intervals during it, that Meno has been put into conversation with Socrates in part so that some things about the teachings of Gorgias, Meno's mentor, should become clearer.[20*] But if Meno

[19] E. R. Dodds puts the same point cleverly when he says of the *Gorgias* that in it Plato had not yet encumbered himself with all of the "metaphysical baggage" of the *Republic*.

[20] A point of the dialogue's drama reinforces this otherwise somewhat strained linkage of the slave-boy to Gorgias. It will be recalled that Socrates felt invited to answer Meno's (unflattering) simile, "You are like a sting-ray," with a counter-simile, in which he would construct Meno's likeness (80c). But, for the moment at least, he turned down the invitation, lest he only increase Meno's vanity and willfulness. Cf. Jacob Klein, *A Commentary on Plato's Meno* (Chapel Hill, 1965), pp. 88–90. In the middle of the slave-boy episode (84A–C), however, Socrates makes it clear that the boy is being made to represent Meno quite exactly. They are both the very model of the (gorgianically) pompous, who will hold forth "before many and on many occasions" (84B; cf. 80B) on a subject of

had only paid attention to the Master, most especially when he touched on topics relating to what is, what is not, and what becomes, he would not have found the least difficulty in catching up Socrates on this matter of the sides of the constructed square only "becoming" equal. For with Socrates himself introducing the language of becoming, and with the slave-boy echoing and emphasizing that very terminology, any gorgianic with a tincture of dialectical subtlety could promptly reduce the rest of Socrates' lesson to sheer non-being. He need only remember the argument out of *On Nature* which concludes: "It is altogether impossible for being to be generated" (οὐδὲ γένετον δύναται εἶναι τὸ ὄν).[21] Or, taking Socrates at his word, he could continue: "but things which *become* equal are at once equal and not-equal." But this only raises the question more forcibly: does Socrates really mean to say that the constructed square, which will turn out to be the "right answer," suffers from the fundamental logical defect that its sides both are and are-not equal? There are considerations from the history of mathematics which lead strongly to the conclusion that he meant to say exactly that.[22]

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which they are ignorant. This sort of pomposity is explicitly charged both to Gorgias and to those he influenced: *Meno* 70c.

* [The similarity of Meno to Gorgias is further strengthened by the evidences (reviewed now by Guthrie, *History of Greek Philosophy*, III, 253–254) concerning Gorgias' way of defining virtue(s), i.e., by enumerating. Defining virtue by enumerating that of man, woman, slave, and so on, which Aristotle ascribes to Gorgias, is just what Meno does in his first answer to Socrates. How faithful this is to the real Gorgias may be left out of consideration. In any case Plato's picture of Meno on virtue looked to Aristotle like a picture of Gorgias on virtue. And this gives a strong indication that there is such a similarity, in fact or at least in Plato's intention.]

21 Diels and Kranz, *Die Fragmente der Vorsokratiker*, 5th revised edition (Berlin, 1934), II, 280 (Gorgias).

22 In section IV I shall be returning to the point about the impossibility

I have reviewed the questionable features of the setting up of the problem in Expt. II, and have also raised a question about one of the steps in the argument in it. If these doubts correspond to real defects in Expt. II itself, defects which Plato deliberately put there, one would expect the conclusion of it also to betray its weakness as a whole. And indeed there are two strong indications, one having to do with the content of the boy's concluding answer, the other having to do with its form, which brand it as sophistical. For the actual answer which the boy supplies not only fails to identify the required thing in terms of a number, but it even fails to identify it by any property which is geometrical, properly so called. His concluding answer is "this" (pointing). Thus the answer is identified nondiscursively, by being pointed to "before Socrates' eyes."[23] That the end result of the inquiry as a whole should amount to nothing more than a sense object pointed out in the diagram only brings out more forcibly the implications of Socrates' condescension at the beginning of Expt. II. When he turned away from arithmetic and grudgingly accepted the "deiktic" procedure, he foredoomed the inquiry of Expt. II to a result inadequate to the requirements of the intellect.

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of the sides of a rectangle containing 8 units of area being "equal." This was the standard way in which Theaetetus expressed the point that the square root of 8 is irrational: a rectangle containing 8 units must have *unequal* sides.

[23] The idea that a sense object is no proper answer to an intellectual search was of course not original with Plato. Aristotle reports that Protagoras held that sensible lines are not the same kind as those of which geometers speak. Similar views were held by Antiphon and Gorgias, as fragments from them attest. Thus when the boy finishes by pointing, we may rightly question whether there is any room in the geometer's world for sense objects. Nor need we be thinking exclusively of a platonic geometer and a rigid separation between *νοητά* and *αἰσθητά*, so that this doubt should remain valid: even in the more elastic theories of many Sophists this sort of geometrizing was prohibited.

Admittedly the boy's answer is not left in the form of a mere "this." But the new form which Socrates gives it only gives rise to more of the same doubts which attach to Expt. II as a whole. Socrates supplies a formula for the boy's last answer by asking: "Do you mean this one which is stretched from corner to corner?" When the boy assents to this description, Socrates promptly dresses it up in the technical name "diagonal" (διάμετρος), and, significantly, credits the nomenclature to "the Sophists" (οἱ σοφισταί). The point of putting the boy's answer in this form is lost in most English translations in that σοφισταί is usually rendered "professors" or "learned men" or some such expression in which the unflattering connotations of "Sophist" are suppressed.[24]* Most recently Bluck[25] has endorsed the view which discounts Plato's association of the boy's answer, in its final form, with the σοφισταί. But when it is noticed that "diagonal" is a name which stands for a description of its geometrical position, and that this description is a *hopoion ti* rather than a *ho ti*, a position, not a size,[26] it be-

[24] Thomas L. Heath, who was not arguing any philosophical position, gives the correct rendering, I think, when he simply calls a Sophist a Sophist. *A History of Greek Mathematics* (Oxford, 1921), I, 298.

* [Guthrie's translation puts all the weight on *diametros;* he is unconvinced by my interpretation of *sophistai.*]

[25] Cf. Bluck's comment *ad loc.* But if this mention of the Sophists does not imply any criticism, can we not with equal reason conclude that the remarks about Gorgias, Protagoras and Prodicus in the dialogue do not imply criticism of them? But this is an absurd result. When he seems to praise the skill of Prodicus according to whom one should notice the fancy (ποικίλος) distinction between the terms "boundary" and "terminus" of a geometric figure (75E), he is clearly ridiculing the fancy terminology. Similarly also with the fancy name for the line which runs from one angle to the opposite, "diagonal."

[26] The difference between something's being "given" merely in respect to its geometrical position and its being "given" or "known" in size was considered important enough by Euclid to be expressed by different definitions. In his *Data,* he defines "being given in size" (Def. 1) and "being

comes plain enough what is sophistical about it. It is the very thing that is sophistical about Meno's eagerness to answer on what virtue is like in advance of finding out what it is. And this readiness to substitute the derivative question for the fundamental one, with its consequences, namely, that the order of inquiry is confused and the result of it becomes unreliable, is a carelessness which in *Meno* is charged indirectly against Gorgias.[27] In *Phaedo,* where Plato is also discussing mathematical problems, he makes the identical point about the dangers of mixing up prior and posterior questions: "You would not mix the two things together like the eristics by discussing

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given in position" (Def. 4) separately. A scholiast from late antiquity remarks on the definitions of "givenness in position" and "in size" as follows: "That a thing is *given* means that it is determinate (*ὡρισμένον*), which latter means something whose boundaries are given either for the intellect (*διανοίᾳ*) or for sense (*αἰσθήσει*): for we can supply equals to these things accordingly—either for the intellect or for sense. Further what is given can be rational or irrational . . ." (*Euclidis Data cum commentario Marini,* ed. H. Menge [Leipzig, 1896], p. 262). The parallelism of "given for sense" and "given irrationally" already suggests that irrationals can fulfill the condition of "definiteness" only in sense, not in intellect. And indeed what other reason can there be, in pure mathematics, for an appeal to sense boundaries except that something which one insists is "given," and therefore determinate, nevertheless lacks intellectual boundaries? Marinus (Proclus' successor) makes a special point of discussing the seeming paradox of something's being at once "known" and "irrational." He cites mathematicians who require all known sizes to be reducible to a known measure, but still permit irrationals to be "known," albeit *approximately* (*πρὸς τὸ σύνεγγυς*) (*Data,* pp. 234, 236).

[27] Since it is not the Sophist Gorgias himself, but only his disciple Meno who is directly examined here, perhaps it is fairer to cite evidence of Gorgias' willingness to invert the order of inquiry as represented in the *Gorgias,* where both he and his disciples are directly questioned. A distinctive fact about both Gorgias' and Polus' responses to Socrates' search for a definition of rhetoric itself is that they are eager to speak first to a derivative question, namely how noble and valuable it is. Socrates has to remind them that he must first find out what it is before he can inquire as to its worth: (*οὐδεὶς ἐρωτᾶ ποία τις . . . ἀλλὰ τίς*) (*Gorgias* 448E).

both the principle . . . and its consequences" (οὐκ ἄν φύροιο ὥσπερ οἱ ἀντιλογικοῖ περί τε τῆς ἀρχῆς . . . καὶ τῶν ἐξ ἐκείνης ὡρμημένων) (101E). Those who deliberately stir up such an Anaxagorean confusion (ὁμοῦ πάντα κυκῶντες) are able to come away as convinced as ever of their own "wisdom" (*sophia*). Thus it is likely to be Sophists who are the target of Plato's very similar criticism here. Therefore when we read that, after an inquiry in which, at a critical point, the order of questions was deliberately inverted, the participants have nevertheless come up with an answer that matches that of the "sophistai," we are not forced to think of it as genuine wisdom which has been secured. To the contrary, the suggestion latent in the term *sophistai* as Plato habitually uses it, reinforced by the facts of the inquiry preceding, leads to the conclusion that it is "wisdom" which is only apparent, not real.[28]

But suppose we turn aside from the foregoing evidences, taking them to be inconclusive. We might then proceed, as Socrates proceeds in the *Meno*, and simply hypothesize the conclusion I have drawn, the intent being to find out what useful consequences flow from it taken as given. This could not

[28] From the fact that Plato closed the doors of his Academy to the ungeometrical it does not follow that he opened them wide to everyone well versed in geometry. A notable instance of someone in whom Plato seemed to find skill in geometry combined with arrogance and unwisdom was the sophist Hippias, whom he treats satirically in *Protagoras* (315, cf. also 318E) even while he credits him with skill in arithmetic, geometry, astronomy, and music. In *Hippias Minor*, which was written either by Plato or by someone very much like him and also contemporary with him, he charges Hippias with using his skill (*empeiria!*) at geometry for proving false as well as true statements (367D). Antiphon the Sophist is another geometer of the time, whom Aristotle later discusses both in *Physics* and in *De Soph. Elen.* as a geometer who arrived at believable but spurious results by specious reasoning (about squaring the circle). Thus not only is there no incoherence in the idea that Plato might criticize certain geometrical arguments, all the while maintaining the highest regard for geometry as a science; it is even true as a fact that he did so, and so did Aristotle.

amount to anything more than a tentative and non-essential look at the slave-boy episode,[29] but it can at least lend some strength to my hypothesis about it. Let us assume, then, that Expt. II is essentially an exhibition of a sophistical course of argument leading not to knowledge of an eternal truth, but merely to a plausible opinion. Four points worthy of attention are implied by this hypothesis, each of which tends to relieve a difficulty in interpreting the *Meno*. These are: (1) we need not explain the anomaly involved in Socrates' claiming to inquire only "as one who does not know" (80CD) when he is about to set up an inquiry in which he knows the answer; (2) we can explain in a straightforward manner why Socrates is so guarded in his concluding claims (85C) about what the boy has learned; (3) it becomes clearer why Socrates offers to* fight for his conclusion by other arguments and other means; and (4) it becomes clear why the particular mathematical problem, with its particular fundamental difficulties, is taken as the subject of investigation.

In connection with the first point, it can be pointed out that it is not only on the strength of the very general, so to say legendary, characteristic of "Socratic ignorance" that we can expect Socrates to inquire in *Meno* 82–85 without himself knowing the answer; it is rather on the strength of what Socrates is made to emphasize himself at the *Meno* 80CD. Can it be that in the part of the dialogue before 80CD we are seeing Plato still behind the mask of socratic ignorance, and that the mask comes off between 80 and 82 to reveal more of the knowing Plato? This would seem an abrupt revelation, not character-

[29] I am borrowing the language of R. Robinson, who emphasizes the importance of Plato's new "method of hypothesis" in *Meno* (*Plato's Earlier Dialectic*, 2nd revised edition [Oxford, 1953], p. 122), in that it permits Plato to "say something positive about virtue, even if tentative and non-essential."

* [I have corrected a mistranslation of 86B6–7 here and removed the part of (3) affected by it here and below, p. 222.]

istic of Plato's writing. Another difficulty for such a reading comes from the fact that as soon as the boy's lesson is over, the mask of socratic ignorance is back on.

The second point relates to the limitations written into the conclusion of the Experiment itself (85CD). What are these limitations? In the first place, Socrates does not say that the boy has learned a bit of knowledge, but says only that he has "had opinions stirred up in him as in a dream" (85C). And of course the point at issue is not whether it is possible to form opinions —to say nothing of "dream opinions"[30]—for Xenophanes and the "eristics" following him had never called that into question. The point at issue is the possibility of *knowledge*. Granted, Socrates does say something about the boy's "knowing," but what he says is remarkably guarded and limited. He does not say that the boy now knows, but only that he "will eventually know" (τελευτῶν . . . ἐπιστήσεται) and even then not "accurately," but only "no less accurately than anyone" (οὐδενὸς ἧττον ἀκριβῶς) (85CD).[31] But what sort of a standard of "knowing" is it which only requires that the learner be eventually no more ignorant

[30] Clearly something is meant by the state of dreaming which would permit the "dreamer" to be asleep or awake. What could be meant is the sort of dreaming which Plato defines in *Republic* (476C): "whether asleep or awake, to mistake sameness of kind (τὸ ὅμοιον) for identity (τὸ αὐτὸ)." It is the same kind of "dreaming" that geometers are said to do about being (533BC).

[31] The question of the "accuracy" of the boy's knowledge does not come up for the first time here after the end of the boy's lesson. It had already been raised before Expt. II began, or more accurately, in the very speech of Socrates in which the transition from Expt. I to Expt. II is made. Socrates there (83E) exhorts the boy to "try to tell us accurately" what the answer is. It is immediately following this exhortation to accuracy that Socrates retreats to the "deiktic" alternative, in which it turns out that only "no less accuracy than" anyone else's is all that can be attained. Another way of stating the point about the arithmetical insolubility of the problem is in terms of "accuracy." No number solves the problem accurately (although numerical approximations can be worked out to ever greater degrees of accuracy). See above, note 26.

than anyone else? It is certainly not a socratic or platonic standard of knowledge, if only for the reason that Socrates himself, after a life of questioning, determined that he was "not more ignorant" than anyone he questioned, but nevertheless did not count himself a knower. Roughly speaking, the standard of relative freedom from ignorance is a sophistical standard of knowledge. For if a Sophist could teach his pupil to be never more ignorant than the next man, he would have stocked him with opinions no human could refute. And a set of opinions, whether true or not, which is invulnerable to the harshest attack is equivalent, for the sophist, to wisdom itself.

Thirdly,[32] there ought to be an explanation for his saying that he would willingly fight for the value of inquiry "in word and deed" (86c). This is the second time Socrates has suggested that he has in mind support for his point that inquiry is not in general futile, support which is other than the support present in the *Meno*. For when he had first introduced the account of recollection, which is some sort of support for this point, he had said (81A) that the holy men and women from whom he had learned this account knew how to argue their doctrines. And this carries with it the suggestion that Socrates knows of, or at least knows others who know of, reasons in support of the recollection account of knowledge other than those which are given in the *Meno*.[33] But both the fact that he "would not rely

[32] [See asterisk note on p. 220.]

[33] Socrates hints that there are "mysteries" (probably pythagorean) surrounding the mathematician's definition of figure, into which Meno remains uninitiated (76E). Thus he declines to go into the more arcane topics with him. But is not the recollection doctrine a still greater "mystery," so that Meno must by stronger reason remain uninitiated into it? A minor difficulty is thus removed by the present hypothesis about the slave-boy experiment, in that Plato would not be representing the proverbially incongruous situation of "an ass listening to the lyre" (*ὄνος λύρας ἀκούων*).

much" on the slave-boy experiment, and the fact that he hints at other ways of supporting his point about the value of inquiry, are naturally enough accounted for if Expt. II itself has an unsatisfactory result.

Lastly, it would be desirable to have an explanation of the fact that Plato chose a mathematical problem of such great technical difficulty on which to exercise the boy. If the boy had been presented as a young man educated in some of the more elementary problems of arithmetic and geometry, but ignorant of topics on the frontiers of the mathematical research of the day, it would be easy enough to explain why Plato had to choose an advanced problem: only thus could he be sure that the boy had not previously learned a solution from a teacher. But in the case of the slave-boy this explanation is obviously not available. He is altogether uneducated: all he knows is how to speak Greek, and of course to count. Therefore Plato could as easily have made his point, if the point is to stir in him a recollection of a piece of eternally true knowledge, by means of a simpler problem. He might have used one which is on the surface only a slight variation of the one he actually uses: how to *quadruple* a given square. Indeed Socrates could have elicited from the boy equally naturally nearly identical incorrect answers ("by quadrupling the side" and "by tripling the side") to the ones which he elicits in the text. But in that case he could have proceeded to guide the boy to an answer which is both arithmetical in form and absolutely correct: by doubling the side. The correctness of the answer could have been proved by counting, and geometry would also have been involved in that lines would have been produced and areas completed. What would *not* have been involved is any recourse to lines whose length, as expressed in terms of the given units, must remain either "unknown" or known only "no less accurately than anyone" knows them. But if it is Plato's intent to present a model of an

inquiry which at first fails to find an accurate answer (Expt. I), then succeeds in finding an answer but only after abandoning the demand for perfect accuracy (Expt. II), the problem of doubling the square is eminently suited to his purpose. And this is just what my hypothesis says Plato is essentially doing in the slave-boy experiment.

III

There is general agreement among scholars concerning the date of the composition of the *Meno*.[34] R. S. Bluck summarized the scholarly consensus and supported it with arguments in his recent edition of the dialogue. On this basis its composition is to be dated shortly after Plato returned from a visit to Magna Graecia, during which trip he had befriended the pythagorean mathematician Archytas of Tarentum. There is also evidence that Plato was impressed by the intellectual and political prowess of Archytas as he was by that of few other men.[35] W. K. C. Guthrie has even ventured the opinion[36] that Plato's account of the philosopher-king in the *Republic* may have been modelled on his friend. It would not be surprising, then, if one were to find in the *Meno*, composed when his recollection of

[34] E. R. Dodds, R. S. Bluck, and, more recently, J. E. Raven in *Plato's Thought in the Making* (Cambridge, 1965), chap. 5, "Meno," have agreed on dating *Meno* after Plato's first trip to Sicily. Ryle's dating of *Meno*, as of so much else, is exceptional (*Plato's Progress* [Cambridge, 1966], p. 220). But it is also based on exceptionally conjectural reasoning.

[35] B. L. van der Waerden ranks Archytas first among the pythagorean influences on Plato. He writes (*Science Awakening*, 2nd edition [New York, 1961], pp. 149–150): "He [Archytas] was on terms of intimate friendship with Plato, who received chiefly through him his initiation in the exact sciences and into Pythagorean philosophy."

[36] W. K. C. Guthrie, *A History of Greek Philosophy* (Cambridge, 1962), I, 333.

his friend was still fresh in Plato's mind, traces of the influence of Archytas.[37] A passage from Archytas' work entitled "On Mathematics" survives in which he sets forth part of his theory of knowing and learning. The resemblance between his philosophical reflections and those developed in the *Meno* is striking. Archytas says:[38]

> When one emerges from a state of ignorance into a state of knowledge, one must either be learning from someone else or discovering the truth for himself; but learning which is from someone else remains someone else's, while what we discover by ourselves becomes our own. Discovery is difficult when we do not inquire; it is straightforward and easy when we do inquire. But when someone does not know how to inquire, it is impossible.

Clearly Archytas believes in the possibility of learning, and also in the superiority of knowledge found out by means of one's own researches, both of which views he holds in common with the Plato of *Meno*. Most striking of all, however, are the three grades of difficulty in discovery outlined by Archytas and the fact that he does the grading in accordance with whether or not one is willing (and if so whether he knows how) to inquire. For in this particular fragment Archytas comes very near to providing a complete outline of the *Meno*. Meno himself is described in the dialogue as having held forth before many and on many occasions on the topic of virtue, and similarly the slave-boy is imagined to hold forth on the topic of doubling the square; they do not thereby discover the truth, however, be-

[37] J. E. Raven, who has done careful scholarship on the pythagoreans, sees in the *Meno* evidence that Plato had learned from pythagoreans shortly before writing it. He goes further in saying (what is nearly identical to Guthrie's view) that Archytas may have been the most important of the pythagorean influences on *Meno* (Raven, *op. cit.*, p. 69).

[38] Diels and Kranz, *ed. cit.*, Vol. I (Archytas B3).

cause they believe they already know and "do not inquire." After Socrates has ensnared them, however, they begin to make discoveries (though perhaps of nothing more than their own ignorance) because they "do inquire." But when Meno forces the discussion with Socrates—and in parallel fashion when Socrates forces the discussion with the slave—to follow the pattern of those who "do not know how to inquire," discovery is impossible, even of their own ignorance. Thus it is up to Socrates to remind Meno after they reach their "conclusion" that they did not even know how to inquire.

Archytas is credited with a variety of mathematical accomplishments in number theory (i.e., arithmetic) and in harmony. Two important accomplishments have direct relevance to the mathematics of *Meno*. The first is his proof, which later writers preserved,[39] that it is impossible to insert a geometric mean between any two numbers which are in "epimoric" ratio. Two numbers are defined as standing in epimoric ratio when the *difference* between them measures each number. The simplest and most obvious example to which Archytas' theorem applies is the ratio 2:1, which is also an important ratio in harmony. The ratio 4:2 is another form of that same "epimoric" ratio. Thus the consequence of Archytas' theorem for the slave-boy problem is that a square cannot be doubled by means of numerically defined lengths.[40] For the fact that the geometric mean between

[39] Diels and Kranz, *ed. cit.*, pp. 429 f. (Archytas A19), Boethius preserved the argument of Archytas in his own work on harmony.

[40] B. L. van der Waerden devotes a careful discussion to this mathematics of Archytas in his book *Science Awakening*, *op. cit.*, pp. 149–159. In connection with the particular theorem about the "epimoric ratio," van der Waerden draws a consequence for pythagorean (rational) geometry, as follows: "If one were to assume—a natural assumption for a Pythagorean—that all line segments can also be expressed by numbers, one would conclude that, for line segments in certain ratios [e.g., 2:1], no mean proportional could exist" (*ibid.*, p. 158).

any number and its double is not expressible numerically is exactly the same thing as the fact that $\sqrt{2}$ is irrational, which is in turn the same thing as the impossibility, within arithmetical limits, of doubling the square. Thus it follows from Archytas' theorem that, whatever multiple one takes of the basic ratio 2:1 (e.g., Plato's multiple 4:2),[41] there does not exist a number of units between that pair which stands "midway" between them, where it is the geometrical sense of "midway" in question.

A second accomplishment is the "Archytan process" for generating rational approximations to simple quadratic irrationals. Tannery was the first to recognize[42] that this ingenious technique was the work of Plato's friend. Archytas' process depends on the fact, well known among the pythagoreans, and referred to in a rough form in one of Archytas' own fragments,[43] that the product of the arithmetic and harmonic means between two numbers (e.g., 4 and 2) is the same as the product of the numbers themselves. Moreover the arithmetic and harmonic means between a pair of rational numbers are always rational. Thus one can "remodel" a rectangle whose sides are 4 and 2 units to form a rectangle whose sides are those means between them. This remodelled rectangle has the same area (8 units), and has sides which are rational. But also its sides are more nearly equal. The remodelled rectangle can be remodelled in turn, again preserving constancy of area and rationality of

41 When Plato has the boy admit that the required value is "between 4 and 2" (83D), he is hinting at the correct (but irrational) value which is the geometric mean between them. The boy's mistake is to choose a rational value "between" them (the arithmetic mean 3), which preserves rationality at the expense of correctness.

42 Paul Tannery, "Du rôle de la musique grecque dans le développement de la mathématique pure" in *Mémoires Scientifiques*, III (Paris, 1915), Nr. 71, pp. 81–82.

43 Diels and Kranz, *ed. cit.* (Archytas B2).

sides, and again diminishing the difference between the values of the sides. By continuing the process, one can generate an arbitrarily good rational approximation to $\sqrt{8}$ (or $\sqrt{n}$ for that matter), since it is a fundamental point in the "theory of Means," with which Plato was familiar, that the geometric mean between any pair of sizes is continually intermediate between the other two means. The process can be conceived as one in which the sides of an 8-unit rectangular area are "becoming equal." Or one can conceive it as a process by which "finally he will know no less accurately than anyone" the side of the 8-foot square.

Archytas' most celebrated mathematical achievement was his solution to the problem of doubling the cube. This achievement is also relevant to the mathematics of the slave-boy passage both as a closely related mathematical topic and as a historically authenticated influence on Plato. Let us consider the mathematics first. The mathematical kinship of Archytas' problem and that of the slave-boy passage can be grasped with the help of modern notation simply enough in the formula, doubling the cube means solving for $\sqrt[3]{2}$, as doubling the square means solving for $\sqrt{2}$. Putting the same point in language which was standard in Plato's time, doubling the cube requires that *two* geometric means be inserted continuously between 1 and 2, doubling the square requires that *one* mean be inserted between 1 and 2.[44] Hippocrates of Chios had been the first to analyze the problem of doubling the cube and to show that it is equivalent to the problem of finding a series of two geometric means between 1 and 2 (i.e., solving the continued proportion $1:x :: x:y :: y:2$). This contribution by Hippocrates did not

[44] T. L. Heath argued that "there is every reason to believe that . . . doubling of the square was what suggested the question whether a construction could not be found for the *doubling of the cube*" (*Works of Archimedes* [Cambridge, 1897], p. cxxiv).

amount to a solution, but only to an analysis which pointed the way to the solutions which were to be worked out by Plato's contemporaries, including notably Archytas. But this brings in the history of the problem, and Plato's involvement with it.

There is ancient evidence to show that Plato not only was acquainted with the problem of doubling the cube, but that he knew—and criticized—Archytas' solution to it. Moreover two important details of the story about Plato and Archytas' problem correspond closely to details of the *Meno* episode. The main evidences are in Theon,[45] Plutarch,[46] and Eutocius[47] (the commentator on Archimedes); these evidences are reinforced by an inscription on a marble tablet in the temple of King Ptolemy III (Euergetes) in Alexandria.[48] All of these evidences indicate that Eratosthenes of Cyrene wrote an outline history of the problem of doubling the cube, and emphasized the part of this history which involved Plato and the Academy. According to the account of Theon, which he bases on Eratosthenes' dialogue "Platonicus," the Delians were given to understand by an oracle that in order to be liberated from a plague, they must double the size of a certain altar. For their builders (ἀρχιτέκτοσιν) the problem posed a great difficulty (πολλὴν ἀπορίαν); they could not figure out how to double a given solid figure, preserving the

[45] Theo Smyrnaeus, *Expositio rerum mathematicarum ad legendum Platonem utilium*, ed. E. Hiller (Leipzig, 1878), p. 2.

[46] Plutarch, *Quaestiones Conviviales*, VIII, 2; *Lives*, "Marcellus," chap. xiv; "De Ei apud Delphos" 386E.

[47] *Archimedis Opera Omnia cum commentariis Eutocii*, ed. J. L. Heiberg (Leipzig, 1881), III, 104–106.

[48] These evidences are discussed by U. von Wilamowitz-Möllendorff, "Ein Weihgeschenk des Eratosthenes," in *Nachrichten von der Gesellschaft der Wissenschaften*, phil.-hist. (Göttingen, 1894). Wilamowitz challenged the genuineness of the so-called "letter to King Ptolemy" on which Eutocius based his account, but did not doubt that the inscription, in which Archytas' work is also mentioned, was genuinely due to Eratosthenes.

same shape. The story as presented in the so-called letter of Eratosthenes amplifies a bit on these difficulties, and explains how earlier attempts at solving the problem had begun with the naive assumption that to double a given solid, one needed only double each of its sides. Eratosthenes explains the mistake by saying that even in the case of a plane figure, doubling the sides does not double its size, but rather quadruples it (*τῶν γὰρ πλευρῶν διπλασιασθεισῶν τὸ μὲν ἐπίπεδον γίνεται τετραπλάσιον*).[49] This way of explaining the mistake, as well as the mistake itself, corresponds very closely to the early phase of the slave-boy experiment.[50] Socrates explains the failure of the boy's first attempt in the words: *Ἀπὸ τῆς διπλασίας [γραμμῆς] ἄρα, ὦ παῖ, οὐ διπλάσιον ἀλλὰ τετραπλάσιον γίγνεται χωρίον* (83BC). ("Therefore on double the line, boy, we do not get double the area, but quadruple.") Thus the course of the slave-boy's work with doubling the square is the same, at least at the beginning, as the work of certain Delians or precursors of the Delians,[51] who worked on doubling the cube. In two particulars, then, the story of duplicating the cube corresponds to the episode in *Meno* in which the problem is to double the square. In both cases it is people untrained in mathematics who try their skill at the doubling, and in both cases their first naive estimate is that the figure can be doubled by doubling one side.

[49] Eutocius' commentary, *op. cit.*, p. 104.

[50] In this very dialogue (*Meno* 76A) Plato recognizes the relation between the geometry of plane and solid figures when he has Socrates repeat the pythagorean definition of plane figure as "the boundary of a solid." In terms of this (pythagorean) definition of "figure," a square would be defined as "the boundary of a cube."

[51] In the report of Eutocius, based on Eratosthenes' "letter," it is the earlier attempt, before the time of Hippocrates, which went wrong because quadratic and cubic doubling was confused with linear doubling. In Plutarch's report, based apparently on Eratosthenes' "Platonicus" it was the Delians themselves who committed this mistake just before calling on Plato for help ("On the Sign of Socrates," 579BC).

Eratosthenes' account of the cube-doubling problem then proceeds to mention the geometrical solution of Archytas and Plato's critical reaction to this. When the Delian engineers were unable to solve the problem, they sought theoretical help from "the geometers about Plato at the Academy" (τοὺς παρὰ τῷ Πλατώνι ἐν Ἀκαδημίᾳ γεωμέτρας).[52] But Plato seems to have been openly critical of the advice which his companions supplied, including the solution of Archytas, because of its dependence on sense. Plutarch reports this part of the story fully. Plato is represented as "incensed" at those around Archytas (and Eudoxus) since they were destroying the good of geometry by turning it away from the incorporeal and knowable (ἀσώματα καὶ νοητά) and toward the sensible (αἰσθητά) with their visible models (αἰσθητὰ παραδείγματα).[53] In this way geometry "reverts to observation instead of raising itself above this. . . ."[54]

Archytas' solution itself has been preserved in Eutocius' commentary. It is at once strikingly ingenious and questionable as to its platonic or pythagorean purity. Van der Waerden, himself an accomplished mathematician, exclaims about Archytas' result: "Is this not admirable? Archytas must have had a truly divine inspiration when he found this construction."[55] But he also observes "In Archytas' diagram, everything is in motion; he thinks kinematically."[56] Now it is not necessary to think that this sort of criticism of Archytas' construction must have come onesidedly from Plato. It must be recalled that Archytas was a pythagorean, and as such may have been as alert to the risks of mixing the mathematical and the sensible orders as was Plato. In fact a fragment survives from Archytas

[52] *Ibid.*

[53] "Marcellus," xiv.

[54] *Quaest. Conv.*, VIII, 2.

[55] Van der Waerden, *op. cit.*, p. 151.

[56] *Ibid.*, p. 152.

in which he expresses his preference for arithmetic as compared with all of the other sciences, including geometry, on account of the greater clarity of its elements.[57]

On the pythagorean distinctions among mathematical sciences, and especially the basic divergence of arithmetic and geometry, Proclus Diadochus offers some illuminating remarks. He explains the basis on which arithmetic is to be preferred to geometry, and illustrates his point by reference to the problem of doubling the square. Arithmetic is a more exact science than geometry according to the criteria of (a) greater simplicity of principles (the 'units' supposed by arithmetic require no position, whereas the 'points' of geometry do), and (b) the fact that it goes after "the reason why" (*τό διὸτι*) rather than merely "the fact that" (*τὸ ὅτι*).[58] He says further that "the cause of figures is among the numbers."[59] Then, to illustrate the process of driving for the more fundamental (arithmetical) explanation (*ἐπὶ τὰς αἰτίας . . . ἐν τοῖς ἀριθμοῖς*), he takes the example of the geometrical doubling of the square (*εὑρόντες ἐν γεωμετρίᾳ τετράγωνον τετραγὼνου διπλάσιον, ἐν ἀριθμοῖς δὲ οὐκ ἔχοντες*) (p. 61). The fact that at the level of causes the construction fails does not take anything away from the intrinsic preferability of seeking the cause in the first place.[60] Proclus ties his discussion of these

[57] Diels and Kranz, *ed. cit.* (Archytas B4).

[58] Proclus Diadochus, *In primum Euclidis Elementorum librum commentarii*, ed. G. Friedlein (Leipzig, 1873), p. 59. Proclus' third criterion (c) dealing with *noeta* rather than *aestheta* is of interest here, although he does not apply it to the case of square doubling, which had not been tainted with "mechanics." He does, however, apply the third criterion to discriminate against proofs requiring mechanics in general.

[59] *Ibid.*, p. 61.

[60] Aristotle uses the language of "cause" in discussing a problem of squaring. He says (*De Anima* II, 2) that the side of the square to be constructed (i.e., the mean proportional between the sides of the given figure) is the "cause," and thus the most fundamental thing to be known.

pythagorean points of method and their mathematical illustrations to Aristotle's discussion (*Posterior Analytics*, I, 27) of criteria for preferring a given science to one which argues from generically different principles.

In another passage of the *Posterior Analytics*[61] Aristotle draws together and helps confirm several of the points above: about method in general, about arithmetical and geometrical methods, and about such methods as illustrated in research about the cube. The general point he is making is that it is inappropriate to seek solutions based on the principles of one science to problems proper to a generically different science. Arithmetic and geometry serve as his paradigm cases of generically different sciences. His discussion is most pointedly relevant here in that he specifies some problems which, because of this difference, "cannot" be solved geometrically. For example the problem of "proving that . . . two cubes (make) a cube" (75^b 12–14). Aristotle's language is highly condensed here, so that, despite the clear testimony of the commentator, Philoponus, T. L. Heath has questioned whether this is indeed a reference to the famous problem of doubling the cube. But on the likely supposition that Philoponus is right,[62] Aristotle is bringing out

[61] *Anal. Post.*, I, 7; cf. especially 75^b 7–14.

[62] Heath thought it "unwary" of Philoponus (*Mathematics in Aristotle* [Oxford, 1949], p. 46) to comment on the passage on the assumption that it was the "cube-doubling" problem at issue. Philoponus does indeed assume this, and even goes into the full story about the Delians and Plato in his lengthy comment. Several reasons can be advanced, however, to support the ancient interpretation against the modern one. The very compression of Aristotle's formula suggests, first of all, that it is a stock problem, a familiar piece of illustrative material. Doubling of the cube is thus a likely candidate. Secondly, Heath must appeal to what Aristotle "must have meant" by the formula *ὅτι οἱ δύο κύβοι κύβος* rather than trust to the altogether common meaning (when no operator is specified) of the *sum* of two cubes. Heath forces the phrase to mean the *product*. Further, Heath's objection that Philoponus must take "two cubes" to mean

the identical point about doubling the cube (or square)[63] as the one commonly taken to be Plato's criticism of Archytas: it is a mistake of method to think that the geometrical solution is sufficient to the problem posed in its arithmetical form. Or more generally, it is a mistake of method to homogenize essentially heterogeneous questions. All of these things seem to be being said in *Meno*, and said with special emphasis in the slave-boy passage.

When it is noticed that these scruples about geometry are common property to Plato, Aristotle, and at least some pythagoreans, it becomes reasonable to think of the criticisms of Archytas' geometry not so much as Plato's criticisms of his pythagorean colleague, but as a more generally based criticism of certain pieces of pythagorean mathematical thought. It could easily have happened that Eratosthenes, an enthusiastic follower of Plato, credited to the disciple (Plato) a view which was really due to the teacher (Archytas). In any case, Plato need not have scolded Archytas for deviating into sense, because Archytas must already have been familiar with the principles on

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the same thing as "twice a cube" misses the mark. Admittedly "the sum of two cubes" is more general than "twice a cube," but then so was Archytas' solution to the famous problem more general—and Philoponus describes it as such. The commensurately universal description of the problem, which is the one Philoponus offers, is increasing a cube "by *any* ratio" to form another cube. The doubling is corollary, as it was for Archytas. But the most serious single reason for preferring Philoponus' reading of the passage is that it preserves the general point Aristotle is after. Aristotle is trying to illustrate problems impossible to solve by geometry *appropriately*, not problems insoluble for it *simply*. We need not force Aristotle's text at all to read him: that a given cube can be increased by any given ratio [e.g., 2:1] by another cube *geometrically* is an essentially different theorem from the theorem that it can be so increased *arithmetically*. Indeed they are as different as the true from the false.

[63] Philoponus reviews both problems together, the cube- and the square-doubling, in his comment *ad loc.*

which the scolding reported by Eratosthenes was based; at most Archytas would have needed a gentle reminder of his own pythagorean principles.

Therefore if the *Meno* and its slave-boy passage do show, as I have argued that they do, the marks of Archytas' influence, in the particulars of its mathematical content, in the reflections on mathematical method implied in it, and in its more general reflections on knowing and learning, then the conclusion of Expt. II, like that of Archytas' own geometrical argument, is subject to the criticism which Eratosthenes ascribes to Plato, and which Aristotle also records: it has abandoned theoretical strictness.[64]

IV

It remains for me to indicate that, from what is now known about the history of mathematics around the time of Plato's *Meno*, the state of mathematical knowledge at that time could have permitted, and perhaps even encouraged, Plato's criti-

[64] In respect to the doubling of the cube, I am of course assuming that Archytas had at least begun this work before the time of the *Meno*. B. L. van der Waerden has advanced some reasons for saying (p. 140) that Archytas did not actually solve it until some ten years after this date (at about the time of the *Republic*). But this would require that Archytas have attained at least forty years of age, perhaps fifty, before making this great discovery. This means that the conjecture has against it the empirical rule that mathematical discoveries of a high order are nearly always made by mathematicians in their youth. (Cf. G. H. Hardy's remark that Ramanujan, one of the greatest mathematicians of the twentieth century in the matter of discovering results, probably was too old when he died to have been expected to produce any more significant results—for he had already reached the advanced age of thirty-two!) But in any case Archytas' actual solution can have dated from as late as *Republic* without injury to my interpretation of the *Meno* in the light of his mathematics.

cisms. I have already outlined the evidences that, at least in the pythagorean circle of Archytas, geometry, especially when compared with arithmetic, was looked on with some suspicion. I have also shown that in Athens, where (among other places) the Sophists Antiphon and Hippias were practicing their skills at geometry, Plato himself, and Aristotle soon after, found fault with their methods of argument. What it remains to do, then, is to sketch an explanation of this fault-finding, in terms of the actual weaknesses of the geometrical science of the time. But I may speak to the more particular question raised by the geometry of the slave-boy passage: incommensurability and the ways mathematicians of that time had developed to deal with it.

Let me deal first with the significant work in this field by an elder contemporary of Plato's, Theodorus of Cyrene. The principal source of our knowledge of Theodorus' work on irrationals is Plato's own later dialogue, *Theaetetus*. When due allowances are made for the dramatic character of the dialogue, the historical point one derives[65] is that some time before the mid-390s Theodorus worked out individual proofs of the irrationality of the "roots" of the numbers 3, 5, . . . 17. We learn also that his pupil Theaetetus carried his work further and formed a universal theorem stating the necessary and sufficient conditions under which *any* natural number will have irrational "roots." Since there is no independent evidence that Theodorus came to Athens, it is generally inferred that some time in the 390s Theaetetus went, as a young man, to study with Theodorus in Cyrene. Plato himself is supposed to have been also in the course of travels at this time, and may not have become familiar with the work of these men until later. But if he did become acquainted with the results of Theodorus and the young The-

[65] The work of Eva Sachs in *De Theaeteto Mathematico Atheniensi* (1914) on settling these dates is definitive. K. von Fritz, in Paulys *RE*, 2nd Series "Theaitetos," follows her.

aetetus before he wrote the *Meno*, he would have had all the more reason to be alarmed at the backward state of the science of geometry. For the proof begun by Theodorus and perfected by Theaetetus is an impossibility proof. It examines the question: "When is it possible to resolve a given number into two equal factors?" Or, if we eliminate the modern-sounding word "factor," the problem becomes "when is it possible to remodel a given rectangular number into a rectangle 'equal by equal' (i.e., a square)?" It is an obvious consequence of Theaetetus' theorem—though, interestingly enough, it does not follow from the less universal theorem of Theodorus—that in the case of the number 8 it is impossible to remodel it into square form. But this result, applied to the slave-boy problem,[66] has only the negative consequence that, since 8 is "by nature oblong" in form it cannot be "assimilated"[67] to a square, which assimilation the boy's problem nevertheless requires. But a proof that a problem is insoluble within certain limits is by no means equiv-

[66] I do not mean to suggest that Theaetetus' work was *necessary* to show the impossibility, within certain limits, of solving the slave-boy problem. I only mean that it is sufficient. Indeed, it is over-sufficient, in that it shows that there are infinitely many such *aporiai* for the arithmetician other than this particular one. Theaetetus' final remark, "And a similar thing holds for solids," suggests that the problem of doubling the cube was also within his scope (and Plato's).

[67] The language according to which plane geometry "assimilates" numbers which are by nature dissimilar comes from the *Epinomis*. Plato (or his disciple) there says that this is *the* problem of plane geometry. But this is of course much later than *Meno*. At the time of the *Meno* geometry had not yet solved "its" problem, for lack of a clear and comprehensive definition of "similar." What *was* known at the time of *Meno* was that some numbers are "by nature" dissimilar to square numbers. Proclus is echoing the same point, and also drawing the consequence about method, when he says: "Despite the same name, similarity (ὁμοιότης) in figures and in numbers are essentially different things. Indeed the mathematician must not demand a single proof for the two of them, for the principles (ἀρχαί) of figures and numbers . . . differ in their underlying kind" (Proclus, p. 33).

alent to a proof that it is soluble independent of those limitations. What then does Theaetetus say about the limits within which it is impossible to assimilate an 8-unit rectangle to a square? The answer is not hard to find: the limits are precisely the restricted theory of "assimilation," or proportion, which had been handed down from pythagoreans of the late fifth century.[68]

But the question then naturally arises, if one elects to work independently of the traditional theory of proportion and its numerical basis, what alternative theory of proportion will one rely upon? To specify the point to fit the context of the *Meno:* even if we are convinced that the problem of doubling the square (or similarly, doubling the cube) is insoluble only because we restrict ourselves to a narrowly arithmetical theory of proportion, what less restricted theory are we to put in its place? May we proceed as if we had a new theory, content simply to *assert* that every number can surely be squared "geometrically," leaving open such questions as how we are to express irrational lengths *other* than by numbers?

I do not believe that Archytas would have approved of such a willingness to abandon theory (and certainly not if it resulted in an appeal to sense), and what Plato reports of Theaetetus' early work suggests that the latter would not have approved either. For Theaetetus adds to his account of his "theorem" that he refuses to consider the side of a number which has been thus, so to say unnaturally, assimilated to the square a "length" properly so called. He thinks of such sides as not lengths, but virtualities (*dynameis*). But what can it mean to say that a number enclosed by sides (i.e., composed of

[68] Van der Waerden puts the point delightfully when he asserts (p. 114) that "Book VII was in apple-pie order at the time of Archytas." Book VII of the *Elements*, to which he refers, is exactly what is meant by the pythagorean theory of proportion.

factors) which have only virtual, or dynamic size has been assimilated to the form of a square? Strictly speaking, it must mean that the two virtualities are equal. The simplest meaning of this, in turn, is that they each have the same ratio to the unit length. Since it is a number which is being worked on, the unit is given. But it is precisely here that the fundamental theoretical impasse makes itself felt. For given the standing theory of ratio and proportion, the ratio of a virtuality to the unit is simply inexpressible. And the theory to replace the standing theory, in which the ratio of a virtuality to the unit *should* be expressible, probably had not been invented by the time Plato wrote *Meno*, or if it had, it had not made itself known to him clearly. The first extant reference to the new theory, which to be sure was not long in being devised, appears in Aristotle's *Topics*, Book VIII, at least some twenty-five or thirty years later. This is the reference in which Aristotle simply asserts that the definition of proportion is "having the same measurement-process (*antanairesis*)."

There is good reason to think that it was Theaetetus himself who worked out that sufficient theory[69] shortly after the composition of the *Meno*, and conceivably prompted by its stimulus. All that is required for my present point about the condition of geometry around 386 is that, whether owing to Theaetetus' youth (he was of age 27 or 29) he had not yet worked out the theory, or owing to the fact that they had both been on travels and the news had not yet reached Plato of his discovery,[70] Plato is criticizing geometry for claiming to be able

[69] The new theory of proportion was itself developed by Theaetetus, probably about a decade after *Meno* was written. This has been argued carefully by Zeuthen, Becker, and van der Waerden.

[70] Plato's remarks in *Laws* 819 f. about the importance of understanding the theory of incommensurables have been much interpreted, most ably and fully by E. Sachs in her *Die Fünf Platonischen Körper* (1917). Plato there says—apparently autobiographically—that he was ashamed not

to assimilate any given size to square form; there are cases for which, on its own best theory of assimilation, this is impossible. What this amounts to on the part of the geometer is a willingness to exaggerate his own theoretical competence, always trusting that the occasions on which he will be challenged to present a full theoretical account[71] will be infrequent. And even then, as happens in the slave-boy experiment, he may be able to conceal his ignorance of fundamental matters under the cloak of having very good opinions about derivative ones.

Let me now sum up what I have argued about the slave-boy passage and the contribution it makes to the *Meno*. I have argued that the experiment falls into two parts which differ importantly. Whereas Expt. I had maintained rigorous standards of knowing, and had failed to find an answer, Expt. II found an answer only by compromising its standards of knowing in a way that Plato, perhaps following Archytas, dis-

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to have learned about problems of incommensurability until "late in life." Clearly he had been exposed early to the fact that such things as incommensurables exist. What he learned about only "later on in life" must have been the sufficient mathematical knowledge to cope with them.

[71] The somewhat difficult formula of *Meno* 98A *αἰτίας λογισμός* takes on a quite definite—if quite narrow—meaning in the present context. For it will be remembered that to seek the "root" of an area to be squared is to seek that area's cause (cf. above, n. 60). And if the preference for arithmetic be taken into account, the cause will need to be expressed numerically. Thus the method of finding the answer would reduce (e.g., in the case of Archytas' method) to an *αἰτίας λογισμός* in the strict sense: a reckoning of the root. If one permits himself an inferior method, for example by hybridizing pure reckoning with mere opinion, he might be thought to be dreaming, or appealing to a sort of *νόθος λογισμός* about space (cf. *Timaeus* 52AB). But clearly such particular issues of mathematical reckoning about space would only be representations of intellectual issues far more universal and fundamental. Any phenomena, whether cosmic or ethical or mathematical, which are elusive to accurate theoretical (or rational) treatment would here be represented, in all their elusiveness.

approves of. But Plato does not necessarily intend a destructive criticism of geometry as such. His intent here is quite harmonious with his approval of geometry in *Republic*. By undermining a sort of geometry which, according to his view, is built on sand, he only wants to make room for another geometry which should be built on intellectually firm foundations. And to judge from what happened in Plato's Academy,[72] which he founded near the time when he was writing the *Meno*, such a geometry was not long in the constructing, one of the builders being the very able mathematician Theaetetus.

Finally it may be in order to offer a word of explanation of why, if my interpretation of the slave-boy passage is correct, it is so completely at variance with the standard interpretations. I would explain this by reference to the fact that not enough has been known until recently about the state of mathematical knowledge in and around Plato's Academy. Since the work of Tannery, Zeuthen, and Heath, however, and also the more specialized work of E. Sachs, O. Becker, O. Toeplitz, many things about the mathematics being done around Plato have become much clearer. More recently, K. Reidemeister and B. L. van der Waerden have contributed more to the understanding of the mathematics in Plato's vicinity. The particular point on which the mathematics in *Meno* so importantly depends, on my interpretation, is the development of a sufficient theory of proportion in answer to the problem of incommensurability. If one looks back at the *Meno* from more than twenty centuries later,

[72] An extremely valuable source of information about the work of the mathematicians at Plato's Academy, including notably Theaetetus and Eudoxus, is Proclus' "Summary," derived from a now lost work by Eudemus of Rhodes, *History of Geometry*. Eudemus had concentrated on the very question which seems to have preoccupied Plato: the development of secure foundations (elements) of geometry. [See *Proclus: A Commentary on the First Book of Euclid's Elements*, trans. G. R. Morrow (Princeton, 1970), pp. 51–52, with Morrow's notes.]

and if he does not take very special pains to dissociate his own conception of geometry, in which of course quadratic irrationality is very easily handled, from the conception of geometry which Plato was likely to have held around 386 B.C., he will naturally fail to see the criticism latent in the second half of the slave-boy experiment. Indeed I do not doubt that from a vantage point as little as thirty years later than that date—around the time of the *Epinomis* say—it may have been hard to see this implied depreciation of the geometry of the time of *Meno*. For even as early as the early Academy the foundations of geometry had been so well firmed up in this particular, by Theaetetus and even more spectacularly by Eudoxus, that it may already have been difficult to imagine a time when the geometrical theory of proportion could have been anything but perfectly clear and sufficient. But in such a state of mind it is more difficult to think of the relation of the diagonal of a square to its side as involving serious theoretical difficulties. Nonetheless I have argued that for Plato in 386 it was indeed a problem involving great difficulties, and as such is a good replica both of the inquiry into the nature of virtue and, more fundamentally, of the inquiry into something which is not known.[73]

[73] Professor Paul Oskar Kristeller advised me in the writing of the dissertation. I am especially grateful to him for the many criticisms by which he helped me improve earlier drafts of this chapter.

Gilbert Ryle / Teaching and training

I have no teaching tricks or pedagogic maxims to impart to you, and I should not impart them to you if I had any. What I want to do is to sort out and locate a notion which is cardinal to the notions of teaching, training, education, etc., about which too little is ordinarily said. This notion is that of *teaching oneself* which goes hand in glove with the notion of *thinking for oneself*. You will all agree, I think, that teaching fails, that is, either the teacher is a failure or the pupil is a failure, if the pupil does not sooner or later become able and apt to arrive at his own solutions to problems. But how, in logic, can anyone be taught to do untaught things? I repeat, how, in logic, can anyone be taught to do untaught things?

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To clear the air, let me begin by quickly putting on one side an unimportant but familiar notion, that of the self-taught man. Normally when we describe someone as a self-taught man we think of a man who having been deprived of tuition from other teachers tries to make himself an historian, say, or a linguist or an astronomer, without criticism, advice or stimulation from anyone else, save from the authors of such textbooks, encyclopaedia articles and linguaphone records as he may happen to hit on. He hits on these, of course, randomly, without having anyone or anything to tell him whether they are good ones, silly ones, old-fashioned ones or cranky ones. We admire the devotion with which he studies, but, save for the rare exception, we pity him for having been the devoted pupil only of that solitary and untrained teacher, himself. However, I am not interested in him.

What I am interested in is this. Take the case of an ordinary unbrilliant, unstupid boy who is learning to read. He has learned to spell and read monosyllables like 'bat,' 'bad,' 'at,' 'ring,' 'sing,' etc., and some two-syllable words like 'running,' 'dagger,' and a few others. We have never taught him, say, the word 'batting.' Yet we find him quite soon reading and spelling unhesitantly the word 'batting.' We ask him who taught him this word and, if he remembers, he says that he had found it out for himself. He has learned from himself how the word 'batting' looks in print, how to write it down on paper and how to spell it out aloud, so in a sense he has taught himself this word—taught it to himself without yet knowing it. How can this be? How can a boy who does not know what 'b-a-t-t-i-n-g' spells teach himself what it spells?

In real life we are not a bit puzzled. It is just what we expect of a not totally stupid child. Yet there is the semblance of a conceptual paradox here, for we seem to be describing him as at a certain stage being able to teach himself something new,

which *ipso facto* was not yet in his repertoire to teach. Here his teacher was as ignorant as the pupil, for they were the same boy. So how can the one learn something from the other?

What should we say? Well, clearly we want to say that the prior things that we *had* taught him, namely words like 'bat,' 'bad,' 'rat' and longer words like 'butter,' 'running,' etc., enabled him and perhaps encouraged him to make a new bit of independent, uncoached progress on his own. We had taught him *how* to read some monosyllables, *how* to run some of them together in dissyllables, and so on. We had taught him a way or some ways of coping with combinations of printed letters, though not in their particular application to this new word 'batting.' He had made this particular application himself. So to speak, we had previously from the deck shown him the ropes and now he climbs one of them with his own hands and feet; that is to say, not being totally stupid, he was able and ready to employ this slightly general knowledge that we had given to him on a new concrete and particular problem that we had not solved for him. We had given him the wherewithal with which to think it out for himself—and this thinking out was his doing and not ours. I could just as well have taken an example from the much more sophisticated stratum where a brilliant undergraduate makes a good philosophical move that no one else has ever taught him, and maybe no one else has ever made.

Naturally, most often the boy or the undergraduate, if asked Who taught you that? would reply not that he had taught it to himself or that he had learned it from himself, but rather that he had found it out or thought it out or worked it out for himself. Just this brings out a big part of what interests me, namely, that though in one way it is obviously impossible for one person's own discovery, whether trivial or important, to be simply what someone else had previously taught him—since it would then not be his discovery—yet in another way

it is and ought to be one main business of a teacher precisely to get his pupils to advance beyond their instructions and to discover new things for themselves, that is, to get them to think things out for themselves. I teach Tommy to read a few words like 'bat,' 'run' and 'running' in order that he may then, of his own motion, find out how to read lots and lots of other words, like 'batting,' that we have not taught to him. Indeed we do not deem him really able to spell or read until he can spell and read things that he has not been introduced to. Nor, to leave the schoolroom for the moment, do I think that Tommy has learned to bicycle until he can do things on his bicycle far more elaborate, speedy, tricky and delicate than the things I drilled him in on the first morning. I taught him the few elements on the first morning just in order that he might then find out for himself how to cope with hosts of non-elementary tasks. I gave him a few stereotyped exercises, and, as I had hoped and expected, in a couple of days he had developed for himself on this basis a fair wealth of boyish skills and dexterities, though he acquired these while I was away in London.

However, there remains a slight feeling of a puzzle or paradox here, and it comes, I think, from this source. A familiar and indispensable part or sort of teaching consists in teaching by rote lists of truths or facts, for example the proposition that 7×7 is 49, etc., the proposition that Waterloo was fought in 1815, etc., and the proposition that Madrid is the capital of Spain, etc. That the pupil has learned a lesson of this propositional sort is shown, in the first instance, by his being able and reasonably ready to reproduce word-perfectly these pieces of information. He gets them by heart, and he can come out with them on demand. Now every teacher knows that only a vanishingly small fraction of his teaching-day really consists in simply reciting lists of such snippets of information to pupils, but very unfortunately, it happens to be the solitary part which

unschooled parents, Sergeant Majors, some silly publicists and some educationalists always think of when they think of teaching and learning. They think or half-think that the request 'Recite what you have learned in school today, Tommy' is a natural and proper one, as if all that Tommy could or should have learned is a number of memorizable propositions; or as if to have learned anything consisted simply in being able to echo it, like a gramophone. As you all know, most teaching has nothing whatsoever in common with this crude, semi-surgical picture of teaching as the forcible insertion into the pupil's memory of strings of officially approved propositions; and I hope to show before long that even that small and of course indispensable part of instruction which is the imparting of factual information is grossly mis-pictured when pictured as literal cramming. Yet, bad as the picture is, it has a powerful hold over people's general theorizings about teaching and learning. Even Tommy's father, after spending the morning in teaching Tommy to swim, to dribble the football or to diagnose and repair what is wrong with the kitchen clock, in the afternoon cheerfully writes to the newspapers letters which take it for granted that all lessons are strings of memorizable propositions. His practice is perfectly sensible, yet still his theory is as silly as it could be.

Perhaps the prevalence of this very thin and partial notion of teaching and learning inherits something from the teaching and learning that are done in the nursery, where things such as 'Hickory Dickory Dock' and simple tunes are learned by heart from that mere vocal repetition which enables the parrot to pick them up too.

Well, in opposition to this shibboleth, I want to switch the centre of gravity of the whole topic on to the notions of Teaching-to so and so, and Learning-to so and so, that is, on to the notion of the development of abilities and competences.

Let us forget for a while the memorization of truths, and, of course, of rhymes and tunes, and attend, instead, to the acquisition of skills, knacks and efficiencies. Consider, for example, lessons in drawing, arithmetic and cricket—and, if you like, in philosophy. These lessons cannot consist of and cannot even contain much of dictated propositions. However many true propositions the child has got by heart, he has not begun to learn to draw or play cricket until he has been given a pencil or a bat and a ball and has practised doing things with them; and even if he progresses magnificently in these arts, he will have little or nothing to reply to his parents if they ask him in the evening to recite to them the propositions that he has learned. He can *exhibit* what he has begun to master, but he cannot *quote* it. To avoid the ambiguity between 'teach' in the sense of 'teach that' and 'teach' in the sense of 'teach to' or 'teach how to,' I shall now sometimes use the word 'train.' The drawing-master, the language-teacher or the cricket-coach *trains* his pupils in drawing or in French pronunciation or in batting or bowling, and this training incorporates only a few items of quotable information. The same is true of philosophy.

Part, but only part of this notion of training is the notion of drilling, i.e., putting the pupil through stereotyped exercises which he masters by sheer repetitions. Thus the recruit learns to slope arms just by going through the same sequence of motions time after time, until he can, so to speak, perform them in his sleep. Circus-dogs and circus-seals are trained in the same way. At the start piano-playing, counting and gear-changing are also taught by simple habituation. But disciplines do not reduce to such sheer drills. Sheer drill, though it is the indispensable beginning of training, is, for most abilities, only their very beginning. Having become able to do certain low-level things automatically and without thinking, the pupil is expected to advance beyond this point and to employ his inculcated au-

tomatisms in higher level tasks which are not automatic, and cannot be done without thinking. Skills, tastes and scruples are more than mere habits, and the disciplines and the self-disciplines which develop them are more than mere rote-exercises.

His translators and commentators have been very unjust to Aristotle on this matter. Though he was the first thinker, and is still the best, systematically to study the notions of ability, skill, training, character, learning, discipline, self-discipline, etc., the translators of his works nearly always render his key-ideas by such terms as 'habit' and 'habituation'—as if, for example, a person who has been trained and self-trained to play the violin, or to behave scrupulously in his dealings with other people acts from sheer habit, in the way in which I do tie up my shoelaces quite automatically and without thinking what I am doing or how to do it. Of course Aristotle knew better than this, and the Greek words that he used are quite grossly mistranslated when rendered merely by such words as 'habit' and 'habituation.' The well-disciplined soldier, who does indeed slope arms automatically, does not also shoot automatically or scout by blind habit or read maps like a marionette.

Nor is Tommy's control of his bicycle merely a rote-performance, though he cannot begin to control his bicycle until he has got some movements by rote. Having learned through sheer habit-formation to keep his balance on his bicycle with both hands on the handlebars, Tommy can now try to ride with one hand off, and later still with both hands in his pockets and his feet off the pedals. He now progresses by experimentation. Or, having got by heart the run of the alphabet from ABC through to XYZ, he can now, but not without thinking, tell you what three letters run *backwards* from RQP, though he has never learned by heart this reversed sequence.

I suggest that our initial seeming paradox, that a learner can sometimes of himself, after a bit of instruction, better his

instructions, is beginning to seem less formidable. The possibility of it is of the same pattern as the familiar fact that the toddler who has this morning taken a few aided steps, tries this afternoon with or without success to take some unaided steps. The swimmer who can now keep himself up in salt water, comes by himself, at first with a bit of extra splashing, to keep himself up in fresh water. How do any formerly difficult things change into now easy things? Or any once untried things into now feasible ones? The answer is just in terms of the familiar notions of the development of abilities by practice, that is trying and failing and then trying again and not failing so often or so badly, and so on.

Notoriously a very few pupils are, over some tasks, so stupid, idle, scared, hostile, bored or defective, that they make no efforts of their own beyond those imposed on them as drill by their trainer. But to be non-stupid, vigorous and interested *is* to be inclined to make, if only as a game, moves beyond the drilled moves, and to practise of oneself, e.g., to multiply beyond 12 × 12, to run through the alphabet backwards, to bicycle with one hand off the handlebar, or to slope arms in the dark with a walking-stick when no drill-sergeant is there. As Aristotle says 'the things that we have got to do when we have learned to do them, we learn to do by doing them.' What I can do today I could not do easily or well or successfully yesterday; and the day before I could not even try to do them; and if I had not tried unsuccessfully yesterday, I should not be succeeding today.

Before returning to go further into some of these key notions of ability, practice, trying, learning to, teaching to, and so on, I want to look back for a moment to the two over-influential notions of teaching *that* so and so, i.e., telling or informing, and of learning *that* so and so, i.e., the old notion of propositional cramming. In a number of nursery, school and univer-

sity subjects, there are necessarily some or many true propositions to be accumulated by the student. He must, for example, learn that Oslo is the capital of Norway, Stockholm is the capital of Sweden and Copenhagen is the capital of Denmark. Or he must learn that the Battle of Trafalgar was fought in 1805 and that of Waterloo in 1815. Or that $7 + 5 = 12$, $7 + 6 = 13$, $7 + 7 = 14$, etc.

At the very start, maybe, the child just memorizes these strings of propositions as he memorizes 'Hickory Dickory Dock,' the alphabet or 'Thirty days hath September.' But so long as parroting is all he can do, he does not yet know the geographical fact, say, that Stockholm is the capital of Sweden, since if you ask him what Stockholm is the capital of, or whether Madrid is the capital of Sweden, he has no idea how to move. He can repeat, but he cannot yet use the memorized dictum. All he can do is to go through the memorized sequence of European capitals from start through to the required one. He does not qualify as knowing that Stockholm is the capital of Sweden until he can detach this proposition from the memorized rigmarole; and can, for example, answer new-type questions like 'of which country out of the three, Italy, Spain and Sweden is Stockholm the capital?' or 'Here is Stockholm on the globe—whereabouts is Sweden?' and so on. To know the geographical fact requires having taken it in, i.e., being able and ready to operate with it, from it, around it and upon it. To possess a piece of information is to be able to mobilize it apart from its rote-neighbours and out of its rote-formulation in unhackneyed and *ad hoc* tasks. Nor does the pupil know that $7 + 7 = 14$ while this is for him only a still undetachable bit of a memorized sing-song, but only when, for example, he can find fault with someone's assertion that $7 + 8 = 14$, or can answer the new-type question. How many 7s are there in 14?, or the new-type question 'If there are seven boys and seven girls in a room,

how many children are in the room?' etc. Only then has he taken it in.

In other words, even to have learned the piece of information *that something is so* is more than merely to be able to parrot the original telling of it—somewhat as to have digested a biscuit is more than merely to have had it popped into one's mouth. Can he or can he not infer from the information that Madrid is the capital of Spain that Madrid is not in Sweden? Can he or can he not tell us what sea-battle occurred ten years before Waterloo?

Notice that I am not in the least deprecating the inculcation of rotes like the alphabet, the figures of the syllogism, 'Hickory Dickory Dock,' the dates of the Kings of England, or sloping arms. A person who has not acquired such rotes cannot progress from and beyond them. All that I am arguing is that he does not qualify as knowing even that Waterloo was fought in 1815 if all that he can do is to sing out this sentence inside the sing-song of a memorized string of such sentences. If he can only echo the syllables that he has heard, he has not yet taken in the information meant to be conveyed by them. He has not grasped it if he cannot handle it. But if he could not even echo things told to him, *a fortiori* he could not operate with, from or upon their informative content. One cannot digest a biscuit unless it is first popped into one's mouth. So we see that even to have learned a true proposition is to have learned *to do* things other than repeating the words in which the truth had been dictated. To have learned even a simple geographical fact is to have become able to cope with some unhabitual geographical tasks, however elementary.

We must now come back to our central question: How is it possible that a person should learn from himself something which he previously did not know, and had not, e.g., been taught by someone else? This question is or embodies the ap-

parently perplexing question: How can one person teach another person to think things out for himself, since if he gives him, say, the new arithmetical thoughts, then they are not the pupil's own thoughts; or if they are his own thoughts, then he did not get them from his teacher? Having led the horse to the water, how can we make him drink? But I have, I hope, shifted the centre of gravity of this seeming puzzle, by making the notions of *learning-to* and *teaching-to* the primary notions. In its new form the question is: How, on the basis of some tuition, can a person today get himself to do something which he had not been able to do yesterday or last year? How can competences, abilities and skills develop? How can trying ever succeed? We are so familiar, in practice, with the fact that abilities do develop, and that tryings can succeed that we find little to puzzle us in the idea that they do.

Looked at from the end of the teacher the question is: How can the teacher get his pupil to make independent moves of his own? If this question is tortured into the shape: How can the teacher make or force his pupil to do things which he is not made or forced to do? i.e., How can the teacher be the initiator of the pupil's initiatives? the answer is obvious. He cannot. I cannot compel the horse to drink thirstily. I cannot coerce Tommy into doing spontaneous things. Either he is not coerced, or they are not spontaneous.

As every teacher, like every drill-sergeant or animal trainer knows in his practice, teaching and training have virtually not yet begun, so long as the pupil is too young, too stupid, too scared or too sulky to respond—and to respond is not just to yield. Where there is a modicum of alacrity, interest or anyhow docility in the pupil, where he tries, however faintheartedly, to get things right rather than wrong, fast rather than slow, neat rather than awkward, where, even, he registers even a slight contempt for the poor performances of others or chagrin

at his own, pleasure at his own successes and envy of those of others, then he is, in however slight a degree, co-operating and so self-moving. He is doing something, though very likely not much, and is not merely having things done to him. He is, however unambitiously and however desultorily, attempting the still difficult. He has at least a little impetus of his own. A corner, however small a corner of his heart is now in the task. The eager pupil is, of course, the one who, when taught, say, to read or spell a few words like 'at,' 'bat' and 'mat' travels home on the bus trying out, just for fun, all the other monosyllables that rhyme with 'at,' to see which of them are words. When taught to read and spell a dissyllable or two, he tries his hand, just for fun and often but not always unsuccessfully, on the polysyllables on the advertisement-boardings; and just for fun he challenges his father to spell long words when he gets home. He does this for fun; but like much play it is spontaneous self-practising. When he returns to school after the holidays, although his spelling and reading are now far in advance of their peak of last term, he will stoutly deny that he has done any work during the holidays. It has not been work, it has been absorption in a new hobby, like exercising a new limb.

His over-modest teacher may say that he has taught this boy next to nothing—nor has he, save for the very beginnings of everything.

However, we should remember that although a total absence of eagerness or even willingness spells total unteachability, the presence of energy, adventurousness and self-motion is not by itself enough. The wild guesser and the haphazard plunger have freedom of movement of a sort, but not of the best sort. Learning how to do new and therefore more or less difficult things does indeed require trying things out for oneself, but if this trying-out is not controlled by any testing or making sure, then its adventurousness is recklessness and not enter-

prise. He is like the gambler, not like the investor. The moves made, though spontaneous, are irresponsible and they yield no dividends. Nothing can be learned by him from their unsuccesses or from their occasional fortuitous successes. He shoots away, but learns nothing from his misses—or from his fluke hits.

It is just here, with the notion of taking care when taking risks, that there enters on the scenes the cardinal notion of *method*, i.e., of techniques, *modi operandi*, rules, canons, procedures, knacks, and even tricks of the trade. In doing a thing that he has never done before, a person may, but need not, operate according to a method, sometimes, even according to a sheer drill that he has adhered to before. If he does, then his action is still an innovation, although the pattern of his action is a familiar and inculcated one. The poet composes a sonnet, taking care to adhere to the regulation 14 lines, to the regulation rhyming scheme, to the regulation metrical pattern, or else perhaps to one of the several permitted patterns—yet, nonetheless, his sonnet is a new one. No one has ever composed *it* before. His teacher who taught him how to compose sonnets had not and could not have made him compose this sonnet, else it would be the teacher's and not the pupil's sonnet. Teaching people how to do things just *is* teaching them methods or *modi operandi;* and it is just because it is one thing to have learned a method and another thing to essay a new application of it that we can say without paradox that the learner's new move is his own move and yet that he may have learned the *how* of making it from someone else. The cook's pudding is a new one and piping hot, but its recipe was known to Mrs. Beeton in the days of Queen Victoria.

Well, then, what sort of a thing is a method? First for what it is not. Despite what many folk would say, a method is not a stereotyped sequence-pattern or routine of actions, inculcatable

by pure rote, like sloping arms or going through the alphabet. The parrot that can run through 'Hickory Dickory Dock' has not learned how to do anything or therefore how not to do it. There is nothing that he takes care not to do.

A method is a learnable way of doing something, where the word 'way' connotes more than mere rote or routine. A way of doing something, or a *modus operandi*, is something general, and general in at least two dimensions. First, the way in which you do a thing, say mount your bicycle, can be the way or a way in which some other people or perhaps most other people mount or try to mount their bicycles. Even if you happen to be the only person who yet does something in a certain way, it is possible that others should in future learn from you or find out for themselves the very same way of doing it. *Modi operandi* are, in principle, public property, though a particular action performed in this way is my action and not yours, or else it is your action and not mine. We mount our bicycles in the same way, but my bicycle-mounting is my action and not yours. You do not make my mincepies, even though we both follow the same Victorian recipe.

The second way in which a method is something general is the obvious one, that there is no limit to the number of actions that may be done in that way. The method is, roughly, applicable anywhere and anywhen, as well as by anyone. For however many people are known by me to have mounted their bicycles in a certain way, I know that there could have been and there could be going to be any number of other bicycle-mountings performed by myself and others in the same way.

Next, methods can be helpfully, if apparently cynically, thought of as systems of avoidances or as patterns of 'don'ts.' The rules, say, of English grammar do not tell us positively what to say or write; they tell us negatively not to say or write such things as 'A dog *are* . . .' and 'Those dogs *is* . . .', and learn-

ing the art of rock-climbing or tree-climbing is, among hundreds of other things, learning never, or hardly ever, to trust one's whole weight to an untried projection or to a branch that is leafless in summer time.

People sometimes grumble at the Ten Commandments on the score that most of them are prohibitions, and not positive injunctions. They have not realized that the notice 'Keep off the grass' licenses us to walk anywhere else we choose; where the notice 'Keep to the gravel' leaves us with almost no freedom of movement. Similarly to have learned a method is to have learned to take care against certain specified kinds of risk, muddle, blind alley, waste, etc. But carefully keeping away from this cliff and from that morass leaves the rest of the countryside open for us to walk light-heartedly in. If I teach you even twenty kinds of things that would make your sonnet a bad sonnet or your argument a bad argument, I have still left you an indefinite amount of elbow-room within which you can construct your own sonnet or argument, and this sonnet or argument of yours, whether brilliant or ordinary or weak, will at least be free of faults of those twenty kinds.

There exists in some quarters the sentimental idea that the teacher who teaches his pupils how to do things is hindering them, as if his apron-strings coerced their leg-movements. We should think of the inculcation of methods rather as training the pupils to avoid specified muddles, blockages, sidetracks and thin ice by training them to recognize these for what they are. Enabling them to avoid troubles, disasters, nuisances and wasted efforts is helping them to move where they want to move. Road signs are not, for the most part, impediments to the flow of traffic. They are preventives of impediments to the flow of traffic.

Of course we can easily think of silly ways of doing things which continue to be taught by grown-ups to children and ad-

hered to by the grown-ups themselves. Not all methods are good methods, or all recipes good recipes. For example, the traditional ban on splitting the infinitive was a silly rule. But the gratuitous though trivial bother of conforming to this particular veto was negligible compared with the handicap that would be suffered by the child who had never been taught or picked up for himself any of the procedures for composing or construing sentences. He would have been kept back at the level of total infancy. He could not say or follow anything at all if, for example, he had not mastered conjunctions, or even verbs, and mastering them involves learning how *not* to make hashes of them.

How does one teach methods or ways of doing things? Well, there is no simple answer to this. Different arts and crafts require different kinds of disciplines; and in some one particular field, say drawing, one teacher works very differently from another. Sometimes a little, sometimes a lot can be told; there is much that cannot be told, but can be shown by example, by caricature and so on. But one thing is indispensable. The pupil himself must, whether under pressure or from interest or ambition or conscientiousness, practise doing what he is learning how to do. Whether in his exercises in the art he religiously models his strokes after Bradman, or whether he tries to win the praise or avoid the strictures or sarcasms of a feared, respected or loved coach, he learns by performing and improves by trying to better his own and his fellows' previous performances by eradicating their faults. The methods of operating taught to him become his personal methods of operating by his own criticized and self-criticized practice. Whether in spelling, in Latin grammar, fencing, arithmetic or philosophy, he learns the ropes, not much by gazing at them or hearing about them, but by trying to climb them—and by trying to climb them less awkwardly, slowly and riskily today than he did yesterday.

So far I have been, for simplicity, dividing the contributions of the teacher and the pupil by saying that the teacher in teaching how to so and so is teaching a method or way of operating, while the pupil keeps his initiative by making his own at the start somewhat arduous, because new, applications of that method. The teacher introduces the pupil to the ropes, but it is for the pupil to try to climb them.

But now we should pay some attention to the fact that pretty soon the pupil has become familiar with the quite general fact that for lots and lots of widely different kinds of operations —spelling, say, skating and bowling at cricket—there exist different *modi operandi*. There are spelling-mistakes and there are bowling-faults, and neither spelling nor bowling can go right unless these faults are systematically avoided. So now, when he undertakes an altogether new kind of operation, canoeing, say, he from the start expects there to be *modi operandi* here too. This too will be a thing that he will have to learn how to do, partly by learning how not to do it. But this time, it may be, there is no one to teach him, and not even any other canoeist to imitate. He has got to find out for himself the way, or anyhow a way, of balancing, propelling and steering his canoe. Well, at first he tries a lot of random things, and nearly all of them end in immersion or collision; but he does after a time find out some ways of managing his craft. He may not achieve elegance or speed, but he does find out how not to topple over and how not to run into obstacles. He is trained, this time purely self-trained, regularly to avoid some kinds of faulty watermanship. But it is because he had previously learned by practice, coaching and imitation the 'hows' of lots of other things such as tree-climbing, spelling and skating, that he now takes it for granted that canoeing has its 'hows' as well, which similarly can be learned by practice, trial and error, and looking for ways of avoiding the repetition of errors. Here, as else-

where, he has to study in order to improve; but this time he has nothing to study save his own unsuccesses and successes.

His more reckless and impatient brother, though full of go, just makes a dash at it, and then another quite different dash at it, and learns nothing or almost nothing from the failures which generally result, or even from the successes which sometimes just happen to result. He is not a self-trainer.

The third brother is uninterested, slow in the uptake, scared or idle. He never chances his arm. He tries nothing, and so initiates nothing either successfully or unsuccessfully. So he never learns to canoe; never, perhaps, even regrets not having learned it or envies those who have. There is no question of his training himself in this particular art, or even, if he is a very bad case, of his being trained by anyone else; just as there was fifty years ago no real question of me training myself or of my being trained by anyone else in the arts of cricket or music.

The supreme reward of the teacher is to turn out from time to time the student who comes to be not merely abreast of his teacher but ahead of him, the student, namely, who advances his subject or his craft not just by adding to it further applications of the established ways of operating, but by discovering new methods or procedures or types which no one could have taught to him. He has given to his subject or his craft a new idea or a battery of new ideas. He is original. He himself, if of a grateful nature, will say that his original idea just grew of itself out of what he had learned from his teachers, his competitors and his colleagues; while they, if of a grateful nature, will say that the new idea was his discovery. Both will be right. His new idea is the fruit of a tree that others had planted and pruned. It is really his own fruit and he is really their tree.

We started off with the apparent paradox that though the teacher in teaching is doing something to his pupil, yet the pupil has learned virtually nothing unless he becomes able and

ready to do things of his own motion other than what the teacher exported to him. We asked: How in logic can the teacher dragoon his pupil into thinking for himself, impose initiative upon him, drive him into self-motion, conscript him into volunteering, enforce originality upon him, or make him operate spontaneously? The answer is that he cannot—and the reason why we half felt that he must do so was that we were unwittingly enslaved by the crude, semi-hydraulic idea that in essence to teach is to pump propositions, like 'Waterloo, 1815' into the pupils' ears, until they regurgitate them automatically.

When we switched from the notion of 'hydraulic injection' to the notion of 'teaching to' or 'teaching how to,' the paradox began to disappear. I can introduce you to a way or the way of doing something, and still your actual essays in the exercise of this craft or competence are yours and not mine. I do not literally make you do them, but I do enable you to do them. I give you the *modus operandi*, but your operatings or tryings to operate according to this *modus* are your own doings and not my inflictings and the practising by which you master the method is your exertion and not mine. I have given you some equipment against failing, *if* you try. But that you try is not something that I can coerce. Teaching is not gate-shutting but gate-opening, yet still the dull or the scared or the lame calf does not walk out into the open field. All this does not imply the popular sentimental corollary that teachers should never be strict, demanding, peremptory or uncondoning. It is often the hard task-master who alone succeeds in instilling mistrust of primrose paths. The father may enlarge the child's freedom of movement by refusing to hold his hand, and the boxing-instructor or the philosophy-tutor may enlarge his pupil's powers of defence and attack by hitting him hard and often. It is not the chocolates and the sponge-cakes that strengthen the child's jaw-muscles. They have other virtues, but not this one.

Martin Andic / Inquiry and virtue in the Meno

Plato's *Meno* is an inquiry into virtue, what it is and how it comes to be in men, whether by teaching or by practice or by gift of nature or in some other way (e.g., chance). Insofar as the teachable is the knowable, it is also an inquiry into knowledge, what it is and how it comes to be in men. The conclusion is reached that the acquisition of knowledge depends on all three of the factors mentioned, insofar as it is the recollection of truth that one has forgotten but can recover for oneself from within oneself if and only if one has the capacity (nature) to apply oneself in a disciplined way (practice) to directed and searching questions[1] (teaching). The inquiry into virtue reaches

Professor Andic's article appears here for the first time.

[1] I model this phrase on one of I. M. Crombie's in *An Examination of Plato's Doctrines* (London, 1962), I, 22: "True teaching, according to the *Meno*, consists in the Socratic method of asking the telling question."

the ostensible conclusion that it comes by chance, insofar as it is a kind of divinely inspired true opinion about good and evil: opinion, because if there are no teachers and students of virtue then it is neither teachable nor knowledge; and inspired, because it is sheer accident if anyone ever has it or, having it, keeps it for long. This result is flagged as uncertain until it is known what virtue is in and by itself. The theory that knowledge is recollection is not qualified in anything like the same terms. However, it has at least two puzzling features that call for explanation.

First, the theory of recollection does not seem to answer the question that prompts its formulation in the dialogue, viz. whether knowledge or inquiry is possible at all; and yet that question was dismissed as the raising of a "trick argument," implying that the question was a stock one among the eristics or debaters of the day, that the argument it raises was and was known to be fallacious. Socrates faces similar fallacies in other dialogues and apparently knows how to resolve them. Why then does he not offer a similar resolution here, in place of the vastly more ambitious and speculative theory of recollection and immortality, which appears not only gratuitous and vacuous but regressive, inviting the same eristic question it is meant to answer? I shall argue that Socrates takes the question more seriously than it probably deserves to be taken from the lips of Meno, because it raises special issues about a priori inquiry that the program of essential definition, with its rejection of appeals to examples and properties, makes inevitable.

Second, Socrates concedes that he does not swear by the whole story of recollection, but says that he is convinced that it is right to believe it, for it makes us better to believe that the acquisition of knowledge is possible and the search for it a duty. But why should the good a belief does you be a reason to think

it true? I want to argue that this is not a tenderminded lapse but the nerve of the whole dialogue and a pointer to the characteristically Socratic conviction that virtue is knowledge of the good, even if virtue does, in the present state of things, come merely by inspiration and as true opinion to those who happen to do what is good.

If I am right, the upshot of the dialogue is that the two inquiries converge and unite in the conclusion that real virtue is not simply true opinion (although it is at least this), because it is knowledge of what is good; indeed it is the acquisition of and even the attempt to acquire this knowledge. It is not putting the case too strongly (although it may be misleading, in the absence of further elucidation) to say that virtue, for Socrates, is the inquiry into what virtue is.

I. The paradox of inquiry, and recollection as a solution

The line of reasoning I shall call Meno's paradox, or the paradox of inquiry, is stated in the following passage:

> MENO. But how will you look for something when you don't in the least know what it is? How on earth are you going to set up something you don't know as the object of your search? To put it another way, even if you come right up against it, how will you know that what you have found is the thing you didn't know?
>
> SOCRATES. I know what you mean. Do you realize that what you are bringing up is the trick argument that a man cannot try to discover either what he knows or what he does not know? He would not seek what he knows, for since he knows it there is no need of the inquiry, nor what he does not know, for in that case he does not even know what he is to look for (80DE).

Now Meno had asked how you can look for what you do not know, much less know it even if you meet with it. Socrates restates this as the question of how you can look for anything at all, known *or* unknown, and apparently takes it for granted that you *can* know something, which one might have supposed the very point at issue. He takes the question whether inquiry is possible as a reference to an argument that it is neither possible nor necessary, and he seems to ignore the issue of how you can know the thing you looked for even if you find it.

This is not a good argument, he says, and he can explain how it fails. Divinely inspired poets, and priests and priestesses of the sort who seek to understand what they say and do when they are inspired (cf. 99C–100A), say that the soul is immortal and that after what is called death it is reborn and goes on forever, so that one must try to live in holiness. They say that the soul has seen everything here and in the other world and has learned everything that is and can recall all the knowledge it once had; for, as nature (everything that is) is akin, a man who recalls the knowledge of any one thing ("learned" it) can discover all the rest if he searches with courage; for what is called seeking and learning is simply recollection, and there is no such thing as teaching (81AD, 82A).[2] Socrates adds that he is convinced of the truth of this doctrine, which "produces energetic seekers after knowledge"; we ought not to follow Meno's "contentious argument," which makes men lazy and weak (81DE).

It is implied that there is a connection between the obligation to live one's life in purity or holiness and the obligation not to believe that inquiry is impossible. The former is a duty to live in virtue and the latter a duty not to live without a con-

[2] For similar passages, see *Phaedo* 72E–84B, 107–114; *Gorgias* 523–527; *Phaedrus* 245C–251A; *Republic* 611B–612A, 614B–621; *Timaeus* 41–47, 90AD.

dition of virtue, viz. inquiry, which requires courage (a virtue) and the belief that inquiry is possible and necessary.

Socrates agrees to try to show Meno that this theory is true. He proceeds to question one of Meno's slaves about the side-length of a square double the area of a square whose side-length is 2 feet. This conversation neatly mirrors the earlier one with Meno about virtue, in that the slave-boy begins by answering confidently but mistakenly and without seriously putting his mind to the matter. (He has the confidence of the man who does not know, not the courage of one who does or who, knowing that he does not know, nevertheless seeks to know [84A, and 70BC, 71E, 81D, and 86B]). He fancies he already knows the answer: obviously, he says, the length wanted will be 4 feet (82E). Socrates reminds him that a 4-foot side-length will give a square not double the area, but quadruple. The boy then proposes the answer of 3 feet but is led to appreciate that this gives a square of 9 square feet and not 8 (83). He is perplexed, aware that he does not know the answer, and (Socrates assures us) he now wants to know what it is. The questioning, criticism, and perplexity have not harmed him but done him good, because now at last he is motivated to inquire for himself (84AC).

Next, by questioning him, Socrates is able to elicit the true opinion that a square built on the diagonal of the given square will be double its area (85B). And this, as Meno concedes, is the boy's own opinion (cf. 84D and 82D). The boy did not know, but he "had" these true opinions about geometry waiting to be aroused; nor does he know now, for these opinions are still dreamlike or easily shaken; yet, if he is questioned properly and repeatedly (by himself or another), they will eventually constitute knowledge as accurate as anyone's. And recovering knowledge in this way, by himself and from within himself, is recollection (85D; cf. 97C–98B).

Moreover, Socrates claims, "He will behave in the same way with all geometrical knowledge and every other subject" (85DE): he "has" true opinions about everything, which "can be aroused by questioning and turned into knowledge" (86A), which is to say that within him there has been knowledge about everything, recoverable by recollection, indeed knowledge about everything knowable. Not having acquired these opinions by teaching in this life (as Meno will confirm), he must have got them before birth or had them always. Having always been either a man or not a man, and having had them in both periods, his soul has always had them and so has always had knowledge about everything, recoverable by recollection!

Since what holds of the slave-boy holds of everyone, if "the truth about reality is always in our soul, the soul must be immortal" (86B), and one must take courage and try to recollect what one does not now remember. Socrates says that he would not like to swear by the whole story but repeats his conviction that

> we shall be better, braver, and more active men if we believe it right to look for what we don't know than if we believe there is no point in looking because what we don't know we can never discover. . . . it is right to inquire into something that one does not know . . . (86BC).

The inference here seems to move from the possibility of knowledge to the fact of immortality, whereas it went in the opposite direction in the initial statement taken from the divinely inspired; and again there is implied a connection between immortality, virtue, the duty to inquire, and the belief that one can and must inquire. But the precise nature of this connection, and of the inference, is obscure.

To help clarify Socrates' reasoning, therefore, let us use some simple abbreviations: let p represent the truth that a square on the diagonal of a given square will be double the

area of the given square, and let *S* represent the slave-boy. Now we can put the theory in the following eleven propositions:[3]

> (1) The true opinion, that *p*, was not taught to *S* but is "his own" in that his reason for thinking that *p* is not simply that anyone else (e.g., Socrates) says or thinks so.

Socrates indeed seems to mislead him at the outset, as much to show him that he is on his own in giving or withholding his assent to the suggestions contained in the questions as to show him that he does not yet know what he fancies he knows.

> (2) The true opinion, that *p*, is already "within" *S*, in that he can grasp its truth a priori, and *only* so: he can grasp that it is true for the reason that it is *necessary* that *p*, and not for the reason that anyone says that *p* or that his senses seem to show him an instance in which it holds.

The crucial point here is that the truths of geometry, like those of essential nature which are Socrates' characteristic concern throughout Plato's dialogues, are truths of necessity. And a necessary truth (or falsehood) does not assert or deny and is not provable or disprovable by any fact such as testimony or sense alone are able to establish, i.e., by any contingent fact. Nor is there any doubt that this is precisely the way Plato understood the matter.[4] Thus in a case of the simplest sort, that

[3] In arriving at the following analysis of the theory, I have been helped greatly by Gregory Vlastos, "*Anamnesis* in the *Meno*," *Dialogue*, IV (1965), 143–167.

[4] The contrast between the necessary and the contingent is, for Plato, a contrast between what is and what seems, in that what most truly is *must be* what it is, whereas what seems *need no more be than not be* what it is, and in this way it amounts to a contrast between what is truly (certainly, infallibly) knowable and what is not. See, e.g., *Phaedo* 78E, 80B, 102AD; *Republic* 476E–480A, 527B, 529B, 585C; *Timaeus* 29BD; *Philebus* 55D–59D and 61DE, especially 59AD. Cf., however, *Philebus* 62AB and *Sophist* 246–249D. Also, Vlastos, "Degrees of Reality in Plato," in *New Essays on Plato and Aristotle*, ed. Renford Bambrough (London, 1965), pp. 1–20.

a triangle has three straight sides must be so whether or not anyone ever says so or any sensible thing is triangular or appears so to anyone, although, necessarily, so far as anything happens to be triangular, that far it will have three straight sides. Again, if only the just man is happy, then this is so, whatever is or seems or is reported to be so with any actual man, although any man, to the extent that he is just, must to that extent be happy, and conversely.[5] In short, necessity is independent of the facts available merely through testimony and sense experience, since these facts can never be more than contingent; and so it cannot be proved or disproved by reference to them alone (although it bears on them, in that it fixes what facts there can be and so what facts can be made available through testimony and sense experience). It can only be grasped a priori, by recognizing it directly or by logical inference from the necessity of other truths already known a priori. Thus Socrates' claim is that *S* already "has," "within himself," a truth that, being necessary, he can grasp a priori and only so.[6]

(3) Its truth will be known by *S* when and because he does grasp it a priori.

Since he can grasp its truth a priori, he can know it. He does

[5] *Republic* 348–368, 427C–445B, 576B–592, and 608C–614A.

[6] Since there is clearly a difference between true opinions which one "has" in that they are explicitly held, or already "aroused," or partially recollected, and those which one "has" only in that they are recollectable (because they are truths of necessity), it may seem advisable to mark this difference by calling the latter simply "truths," and revising theses (6)–(9) below accordingly. However, Plato himself says that it is true opinions that are ever in the soul at least five times before shifting to the formulation that "the truth about reality is always in our soul" (86AB). If he has noticed this difference, he does not call attention to it here.

A further point is that, while it is natural for us to speak (as in the preceding paragraph) of *truths* as what is recollected, Plato repeatedly says that it is *knowledge*. Of course, recollection of the knowledge that *p* is ipso facto recollection of the truth that *p*.

not know it now, for his opinion, "newly aroused," is unstable, and there is no guarantee that he will believe it tomorrow or the very next time he is questioned about it. But he will provide himself with such a guarantee, and will know it, if and when he works out the reason why *p* is and must be true (98A).

> (4) His knowledge of its truth will be *recollection,* in that he will recover it "by himself from within himself," for (a) he will not have been taught it by another (but "by himself") and (b) he will have come by it a priori ("from within himself").
>
> (5) Since he *can* recollect the knowledge of its truth, he has already acquired this knowledge but lost it.
>
> (6) True opinions about everything knowable by recollection are "within" him.

As a generalization from (2), (6) is a claim that *S* already has "within" himself true opinions as to everything of which there can be *a priori knowledge,* viz. all necessary truth. Together with (3)–(5), this entails that *S* can recollect, or acquire, all a priori knowledge because he has already acquired it and now needs only to remember it. However, the remark cited from 85E, "He will behave in the same way with all geometrical knowledge, and every other subject" (cf. 86AB and 81CD), suggests that an even stronger claim is being made:

> (7) True opinions about everything knowable are "within" him.

This means that *S* already has "within" himself true opinions as to everything of which there can be *knowledge,* viz. all knowable truth. Together with (3)–(5), this entails that *S* can recollect, or acquire, all knowledge whatsoever because he has already acquired it and merely forgotten it. If so, Socrates' contention is that *all genuine knowledge is a priori knowledge,* that the truth that is the content of knowledge is necessary truth and that the reality of which there is knowledge is that

which must be what it is and not otherwise. If everything that is is knowable, then it is all knowable a priori, and so-called factual knowledge of contingent truths about sensible reality is knowledge only in a derivative sense at best.

Since it is clear from other dialogues that Plato seriously holds this view,[7] one should not be misled by the use in the *Meno* of examples of factual knowledge, which by themselves might seem to support the weaker claim rather than the stronger. For example, when Socrates contrasts the man who knows the road to Larissa with the man who has only true opinion of it "though he has never been there and does not know it" (97Ac), he is simply saying that the man who knows can be *relied* upon to get there every time and to take others along with him, whereas the man with only true opinion (even if he has been there and back) cannot be relied upon to get there any time, *if* he has nothing to keep him from losing his way (his true opinion) or to enable him to find it again if he loses (forgets) it. And acquiring the grasp which keeps one in possession of it *is* acquiring the knowledge of it: the same truth can be known or truly believed, the difference consisting in one's hold on it. Accordingly, one can take this example as showing that first-hand acquaintance or insight, since it alone renders true opinion stable and teachable, is a criterion even of so-called factual knowledge. Yet, to the degree that the insight possible in purely factual matters is not quite unshakable, the criterion applies only loosely here: factual knowledge is not knowledge unqualifiedly, but only in a secondary sense.

The next step in the theory is this:

> (8) These true opinions about everything knowable have always been "within" him.

That is, it has always been possible for *S* to recollect the knowl-

[7] See the references in n. 4, above.

edge of their truth. And since he has not been taught them in this life and since he has always been either a man or not a man, he has always had these opinions: he has had them at all times when he was a man and at all times since the time when he acquired them (e.g., at or before birth) *if* there was such a time. Now that there was no such time, so that he has had them at all times whatsoever (much less that there was ever a time when *he* was not a man but had these opinions, nevertheless, "in his soul") has not yet been shown. But this is just what Socrates proposes to infer:

> (9) Since true opinions about everything knowable have been within him always, the soul is immortal.

This is to say: since all times he has true opinions about everything knowable are times he has already had (but lost) the knowledge of their truth, all times are times he has already had that knowledge. Now, of course, being able to get something again entails, *timelessly*, having had it previously, but this hardly shows that anyone who can get something again has *throughout the whole of time* had it previously. What is curious is that Plato states and criticizes similar reasoning in the *Euthydemus*, a dialogue generally thought to have been written at a date close to that of the *Meno*.[8] Why he should have used such reasoning here if he was conscious of its fallacy is at first sight puzzling.[9]

[8] 295B–296D. There is some disagreement among scholars whether the *Euthydemus* was written before or after the *Meno:* see R. S. Bluck, *Plato's Meno* (Cambridge, 1961), pp. 113–115, for an argument that it is earlier. That it is at least contemporary with the *Meno* and that its sophistries are treated as familiar ones, suffices for present purposes.

[9] See n. 40, below. Cf. also the argument at *Phaedo* 73C–77A: the character of being equal is not identical with any of its sensible examples, for while they may variously appear unequal without changing in themselves, it is unqualifiedly, indeed self-identically, and never appears

The generalization of (9) from *S* to everyone yields the following two theses as conclusions of the theory:

(10) The truth about everything knowable (and, if everything that is is knowable, then all truth) is already "within" everyone, in that everyone *can* know it a priori and need only recollect it.

(11) The soul in everyone is immortal, since what it always *can* know a priori, it always *has* known prior to all earthly experience.

An apparent solution to Meno's paradox follows directly:

> You can look for what you do not already know, for you once knew it and need only recollect it. But you must exert yourself to look for it, for you have forgotten it and do not know it now.

This neat solution, however, does not seem quite adequate. It appears, on the face of it, at once too much of a solution and too little. Too much, because it is hardly *more* certain than that inquiry is possible. It seems to involve an outrageous rejection of all factual knowledge, as well as a dubious play on "recognize" and "recollect." Plato has given us no good reason

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to be other than, the character it is. But these sensibles make us think of it, so far as they *appear to be* more or less equal. That is, *perceiving* them *to be* sensibly equal entails thinking of them as more or less (but not unqualifiedly) equal, and so it entails already knowing (however obscurely) what being equal is. But since we began to use our senses at birth, we must have got the knowledge of the character no later than then; and as we seem to have all but lost it, we must have got it before birth and then forgotten it (for we can't have both got and lost it in the same instant), so that our recovery of it now ("learning") is recollection. Now this argument becomes suspicious at 75B9 where Plato suddenly shifts from "perceiving" to "using the senses." Yet that sensation in itself does not involve thought is a thesis argued in other dialogues, e.g., *Theaetetus* 184B–186; see also 191–195D and *Phaedo* 65–67B.

to suppose that recognizing something a priori that one has not been explicitly taught (by sense experience or the testimony of others) entails remembering something learned or, in any case known, in a life prior to this life. And even if the inference to immortality were not gratuitous, as Plato himself is perhaps aware that it is, it would provide too little of a solution to Meno's paradox, because it can be restated as a paradox about recollection: if you already know what you are to recollect, you need not try; and if you do not already know this, you cannot succeed. That is, if you do not know what you are to recollect, how can you know it even if you think of it? It is not enough to say that you recognize it, for the question being asked is, how you can do this or, at any rate, how you can know that you do. And besides being regressive (or merely postponing the solution that it purports to provide but that it itself requires as much or as little as knowledge proper requires it), the theory that knowledge is recollection seems vacuous, an appeal to something we know not what: for what faculties are we supposed to have had then, in our prenatal condition, that we lack now, or to have lacked then that now encumber us, so that then we knew easily and directly what now we must labor with such difficulty to recall? All in all, the theory that knowledge is recollection seems at first blush to be a doubtful basis for a proof that knowledge is even possible.

II. *Knowledge and ignorance in the* Euthydemus *and* Charmides

The question whether you can know what you do not know comes up in various ways in Plato's *Euthydemus*, a dialogue about sophisms or, more properly, about the differences be-

tween eristic and Socratic argument.[10] Thus, at 275D–278C, Euthydemus and Dionysodorus confront young Cleinias with a battery of arguments whose gist is this:

> Since those who learn are those who do not yet know what they learn, they are not the wise who learn but the ignorant. Yet since they can and do learn it, they are not the ignorant but the wise (275D–276C). Again, when pupils learn what is dictated to them in letters they know, they learn what they already know. Yet since they get knowledge they do not have, they learn what they do not already know (276D–277C).

Socrates' comment at 277D–278B, that this is simply a frivolous game with the fact that to *learn* may be to *get* or to *have* knowledge, indicates that he clearly grasps the equivocation involved: as those who *get* anything get and now have what they do not have before they get it, and thus they both have and do not have what they get, so those who *learn* anything learn and now

[10] Eristic is typically aimed at reducing an opponent to self-contradiction by obliging him to answer a series of yes-or-no questions, each so designed that, whichever way he answers, he will be refuted. Because no holds are barred, the refutation is often purely verbal, depending on equivocation. Socratic argument is also aimed at revealing inconsistencies in a man's opinions, but leaves it to him to judge which of his conflicting opinions he shall abandon or amend; the object is not victory but discovery of the truth and, more directly, to convince the interlocutor that he does not yet *know* the truth he fancies he knows, and to arouse his curiosity and his desire to find it out, as well as to give him practice in seeking it properly. This does him good, especially if the topic is what it is good or evil to do and to be and to have; whereas eristic has no use except for winning disputes with those who do not know or care to know.

See, besides the *Euthydemus*, *Phaedo* 90BD, 101DE; *Republic* 454, 499A, 538C–539; also *Sophist* 221C–235C (esp. 226B–231B), 259BD, 264–268; *Gorgias* 462–465, 471E–472D, 473E–474B, 495AB; *Dissoi Logoi*, translated by R. Kent Sprague, MIND, LXXVII (1968), 155–167; and Norman Gulley, *The Philosophy of Socrates* (New York, 1968), chap. 1, "Socratic Method."

know what they do not know before they learn it, and thus they both know and do not know what they learn. It is, therefore, *not* in the same respect and at the same time that they both know and do not know what they learn. Otherwise, although Socrates does not expressly draw this lesson, learning would be impossible, likewise forgetting, getting and losing, starting and stopping, to *X* and to be *X*'d (where *X* keeps a place for any transitive verb), and indeed all change whatever. This is illustrated by the argument at 283BC: you want Cleinias to become wise and so to become what he is not and no longer to be what he is. You want him, what he is, no longer to be; and so you want *him* no longer to be! This can be read as an application of the Eleatic principle that change is unintelligible, since it would require a thing to pass from being what it is to not-being. But it can also be read as a misuse of the law of non-contradiction: the not wise cannot be or become wise, since after all being not wise *entails* not being wise. Similarly, and this would be an explicit form of Meno's paradox, the unknown cannot be or become known, since being unknown *entails* not being known: so far as anything is sought after, it is unknown and so unknowable.

It is therefore of great interest that we find the law of non-contradiction stated at 293CD[11] and at once misapplied in a series of bad arguments, acutely criticized by Socrates, culminating in this one at 296B: You would not be capable of knowing everything if you did not know everything! This is as if to argue: You could not write if you did not write (i.e., you cannot both write and not write at the same time), and so you *can* write, only if you *do* write. But the law in question requires that, for any property *F* fully specified in regard to time and respect

[11] ". . . it is impossible both to be and not to be the same thing . . . at the same time and in respect to the same things." Cf. *Republic* 436E–437A and 436B.

of application, nothing is both *F* and not-*F*; and this means that nothing can *be F* unless it *is F*; it does not mean that nothing *can be F*, unless it *is F*.[12] To put it another way, and schematically, from *Necessarily* (*Fa only if Fa*) it does not follow that *Fa only if* (*Necessarily Fa*). From the fact that the unknown cannot also be known at the same time and in the same respect, it does not follow that it simply cannot be known. So it is fallacious to argue, as Meno might have done, that you cannot know what you do not know because you *can* know only what you *do* know.

It seems likely that Socrates could have answered Meno on these lines if the paradox had been stated in this way.[13] However, Meno did not put it in just this way: he might, perhaps, have conceded the point that "is not known" does not entail "cannot be known" and still have insisted on his question:

> But how will you look for something when you don't in the least know what it is? . . . Even if you come right up against it, how will you know that what you have found is the thing you didn't know? (80D).

The issue here is whether you can know *what* you seek, and recognize it even if you encounter it, when you seek what you do *not* know.

[12] See Aristotle, *On Sophistical Refutations* 166a23–31, and 177b20–26. Also, *Metaphysics* 1046b29–1047a29; cf. 999b12, however ("whatever has come to be exists necessarily once it has come to be"), with the application in *On Interpretation*, chap. 9, esp. 19a23–b2.

[13] His actual answer, the theory of recollection, admits of the retort, "You cannot seek to remember what you do not remember, because seeking to do so *entails* not doing so; you can remember only what you do remember." To this, as we now see, he can reply, "So far as you seek to remember anything, that far you do not remember it; but it *need* not (ever or forever) be so (or have been, or continue to be), for we are still waiting for the argument that it cannot be remembered." But this is not the way Socrates proceeds with Meno, and we shall have to consider why not.

Now this very issue, whether you can "know what you do not know and that you do not know it," arises in the *Charmides*.[14] Critias proposes that temperance or wisdom (treated by the speakers as equivalent) consists in self-knowledge (164D–165B). He had just said that temperance is doing good, to which Socrates objected that, if one can do what is good without knowing that it is so, then one may not know one's own temperance but exercise it unawares. (Socrates hints that it is knowing that one knows and does what is good.) Impossible, says Critias; it is self-knowledge. But if it is knowledge, he is asked, what is its result or benefit or subject matter?[15] Here he blunders. Wisdom, he says, is a unique sort of knowledge: other knowledge is not knowledge of itself but of something else, whereas wisdom is knowledge of itself *and* of other knowledge (166BC); or, as Socrates leads him to say, it is knowledge of knowledge (and ignorance) and *not* of something else (167B). Thus

> the wise or temperate man, and he only, will know himself, and be able to examine what he knows or does not know, and to see what others know and think that they know and do really know, and what they do not know and fancy that they know when they do not. No other person will be able to do this. And this is wisdom and temperance and self-knowledge —for a man to know what he knows, and what he does not know? That is your meaning? ——— Yes (167A).

Socrates then proposes to investigate whether such wisdom

[14] The *Charmides* is generally acknowledged to be an earlier work than both *Euthydemus* and *Meno*. The following discussion owes much to T. G. Tuckey, *Plato's Charmides*, Cambridge Classical Studies (Cambridge, 1951).

[15] The replies wanted seem to be (respectively): health of the soul or virtue, happiness, and good and evil. See 157AB, 174BC, 175A, and 175E–176A.

is possible and, if possible, whether it is useful. One might well expect positive answers to both questions, since this looks like the Socratic wisdom described in the *Apology* as the condition of virtue and happiness.[16] But Critias had claimed (or is led to say that he meant) not merely that the wise man only (i.e., uniquely and essentially) "knows that he knows what he knows and that he does not know what he does not know" (167B), but that he knows only (i.e., simply and solely) this.[17]

Such wisdom, however, seems impossible. For how can you know *only* that you do or do not know? If you know that you know, you must know *something* that is what you know (167B–169C). But knowing, either of yourself or of another, *only* that you do or do not know something, will not help you to know *what* this is. So this wisdom seems useless even if possible (169D–171C).

It would be "a great advantage" (171D) and most desirable to be wise if it did somehow enable us to know what we and others do and do not know, for then we should never attempt to do what we do not know, but discover those who do and be guided only by them; and thus we should do nobly and well and be happy (171D–172A). Anyhow, such (Socratic) wisdom would strengthen our insight and our power to reason and to learn (172B). And yet, again, just how would it benefit us? Even if wisdom enabled us to do everything in accordance with knowledge, our own or another's, it would not be knowledge as such that made us act rightly and happily—not just any and every sort of knowledge, e.g., shoemaking, navigation, strategy, or medicine—but only the knowledge of good and evil. Without this, other knowledge would make us efficient but not

[16] 20D–23B, 28–32A, 33C, and 40E–41C. Cf. *Charmides* 165B, 166CD, 167AC, 169AC, 169E–170A, 173AD, and 175–176A.

[17] 167BC, 168A, 169A, 170A, and 174E. Cf. *Republic* 340–347 and 438 and *Sophist* 257CD.

necessarily happy or good. But if (Critian) wisdom is neither a professional skill, nor knowledge of good and evil, then what good is it? (172C–175A). However, Socrates concludes, since wisdom is "the best of all things" (175A), indeed "a great good" having which is happiness (175E), our inquiry must be unsound. We unwisely granted that (Critian) wisdom is possible because,

> we wanted to show that the wise man had knowledge of what he knew and of what he did not know. We generously made the concession and never even considered the impossibility of a man knowing in a sort of way that which he does not know at all. According to our admission, he knows that which he does not know—than which nothing, as I think, can be more irrational (175C).

The absurdity Socrates finds in the notion of "a man's knowing somehow that which he does not know anyhow" can, I think, be brought out by considering two points about the foregoing inquiry.

First, it was urged (at 170D–171C) that the wise man cannot question the physician about *medicine* so as to learn whether he knows what health is, for if the physician is not also a wise man he will not know medicine, since this is the knowledge of health and to know it would be to know knowledge, and so to know what one knows, or be wise! But, of course, by this reasoning the physician will not know what *health* is, either. And what follows from the absurdity of this is not that knowledge entails self-knowledge, but that "knows what he knows" can mean not merely "knows that he knows what he knows and that he does not know what he does not know" (167B), but also "knows what he knows (his knowledge)," taken by analogy with "feels what he feels (his feelings)" or "dreams what he dreams (his dreams)" and the like, where "what he knows" is simply an internal accusative to the

verb "knows."[18] On this reading, a man *must* know what he knows and *cannot* know what he does not know; indeed he cannot *know* what another knows any more than he can *do* what another does: he knows always and only *his own* knowledge. But so far as this is true, it is purely trivial and proves nothing about his knowledge or ignorance of his own or of another's knowledge or ignorance, as most naturally understood.

Second, it was argued (at 170AD) that a man who is wise and thus knows only that he or another knows something will not know *what* this is. But this really shows that he cannot know so little, viz. only that he knows something or other and nothing in particular. Of course, if he does not know medicine or politics, then he will not know what health or justice are, nor that he knows them. From this it follows trivially that he will not recognize the presence of this knowledge in himself, but it does not follow that he will not recognize its *absence* in himself or in another, or its presence in himself or in another if and when he comes to have it. The fact is, not knowing that particular thing that he or another does not know does not logically exclude his knowing what general sort of thing it is. For discovering his own or another's ignorance of a subject, it suffices to recognize *logical incoherence* in his opinions about it.[19] Moreover, his repeated failure despite bold and vigorous attempts to discover such incoherence is reason to think that he has found someone who does know.

The upshot is that a man's knowing that he *knows* something entails his knowing what he knows, or knowing some-

18 See Gilbert Ryle, *The Concept of Mind* (London, 1949), p. 209; also, J. L. Austin, "Unfair to Facts," in *Philosophical Papers*, ed. J. O. Urmson and G. J. Warnock (Oxford, 1961), esp. pp. 116–122.

19 Cf. Tuckey, *op. cit.*, pp. 65–73; and Aristotle, *On Sophistical Refutations* XI.

thing in particular which is what he knows. On the other hand, his knowing that he does *not* know something entails his knowing *what* it is he does not know, but not his knowing *that which* he does not know: it does not entail his having the very knowledge he lacks. To suppose otherwise, I take it, is to fall in with the "irrational" notion Socrates warns against in 175c.

Now if there is no general objection to knowing what it is that you do not know, then one might suppose there will be none to seeking it, that is, to seeking that which is what you do not know. But this, apparently, is to concede that you *can* know what you seek and can recognize it if and when you encounter it, which is just what Meno wished to have proved to him.

Thus you can *characterize* (not necessarily in words) what sort of thing it is you seek, even if you cannot as yet *identify* which thing it is that fills that description, if there *is* such a thing. For, from the fact that you look for a thing of that sort, it does not logically follow that there is anything of that sort, much less exactly one; nor does it follow that anything is or could be such as to have just the features described and no others. On the other hand, Meno's paradox takes it for granted that you can and indeed you must know *what* it is you look for, since looking for anything is having an answer to the question, "What is it you are looking for?"; and this (unlike *that which is* what you look for) *is* precisely what you *think* it is.[20] The upshot is that you can, if you meet with it, recognize that which fills the bill you have, so to say, just because you do and must know what bill this is that you have got to fill.

Yet our curiosity should be aroused whether there are special conditions of looking for virtue that account for the puzzling fact that Socrates, apparently having this type of reply to

[20] Inquiry was alleged to be impossible insofar as it involves ignorance of this.

Meno's paradox available to him, does not give it, but instead produces the grand theory of recollection.[21]

An important consideration here is that Meno and Socrates are after the *nature* of virtue. And whatever Meno himself may have had in mind, his question about inquiry can be taken as having a special application to this a priori search for essence:

> How can you seek to know the nature of that (virtue) whose nature you do not know, since after all you do not know the nature of that whose nature you seek to know?

Since what virtue is and that which virtue is are one and the same, the Charmidean distinction between knowing what and knowing that which you seek to know, or between characterizing and identifying the object of inquiry, will not get us far in this case. We may well suspect, therefore, that inquiry into the nature of virtue does have special conditions of its own. Moreover, the solutions considered hitherto have presupposed that, knowing what you do not know, you can recognize it if you encounter it; and again that you can recognize necessary truths and falsehoods when you meet them. That is, it has been *argued* in these solutions that such truths, if unknown, are not necessarily unknowable but simply *assumed* that they are necessarily knowable. It may be that Socrates means to address himself precisely to the skeptic who questions this very assumption. This possibility will be examined in the next section, by

[21] To his actual answer, the theory of recollection, one might rejoin, "You cannot seek to remember what you do not already remember, since, even if you think of it, you will not know it to be what you are after because you do not even know what this is." To this, as we now see, he can answer, "Knowing what you do not remember, and seeking to remember it, and being able to recognize it in case you think of it, do not entail either knowing that which, or not knowing what, you seek to remember." But the argument does not proceed in just this way, and we must now face the question why this is so.

way of a review of the general program of essential definition in which Socrates seeks to enlist Meno.

III. Knowledge of essence vs. knowledge of properties and cases

Meno appears in the dialogue as a man who does not know how to look for things, or things like virtue at any rate. Under the bad influence of Gorgias, who has "captured the hearts" (70B), although evidently not the minds, of the leading Larissans by his example of inviting questions on any and every subject and confidently answering them all as if he knew what he is talking about, Meno is in the habit of supposing that you can know (a) what something *is like*, and (b) which things *exemplify* it, before you know what it *is* in and by itself. According to Socrates, (a) is the mistake of trying to pronounce upon a *property* of something before you know its essence, and (b) is the mistake of trying to explain that essence by mentioning or describing one or more *cases* of it, as if you could know that they are cases before you know precisely what it is of which they are supposed to be cases. The upshot is that, in stating his challenge, "Can you tell me, Socrates, is virtue teachable?" (70A), Meno fancies that he already knows what by Socratic standards he does not know, viz. what virtue is. He needs Socratic questioning to make him recognize this for himself, a recognition that should make him feel perplexity and desire to discover what he needs most of all to know.

Let us consider the reasons Socrates gives for rejecting these two notions and for demanding a general definition as a condition of knowing what you are talking about.[22] His reasons

[22] That (a) and (b) are mistakes, Socrates asserts and occasionally argues in other dialogues besides the *Meno*. In regard to (a), see *Laches* 185 and

have, I think, more force than is generally supposed, as will emerge in considering three familiar objections to his program. Yet there are difficulties that are effectively summed up in Meno's paradox and that the theory of recollection may have been designed in part to resolve.

Why does Socrates think that (a) is a mistake? He says:

> [I] confess to my shame that I have no knowledge about virtue at all. And how can I know a property of something when I don't even know what it is? Do you suppose that somebody entirely ignorant who Meno is could say whether he is handsome and rich and wellborn or the reverse (71c)?

Meno simply concedes the point, but there are problems about the application of the analogy. At first blush the reasoning is this. Knowing a property of Meno without knowing who Meno is would amount to knowing only that *someone or other* has this name and this property but not *which particular* man has both; and not knowing which man is Meno is not knowing *Meno* at all, even as having this property, nor therefore is it knowing anything *about* Meno.

An obstacle for this reading, however, is that knowing what virtue is is not a matter of knowing which character it is, but of knowing its constitution, its essential definition, or what must be true of anything if and only if and because it is virtue; and so it is unlike knowing who Meno is, for so far as he is Meno and not another thing, he has no essential definition. As we have seen, there are no necessary truths about him except

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190BC; *Phaedrus* 259E–260E and (though note the context) 237C; *Republic* 354B; and *Theaetetus* 196DE; cf. *Euthyphro* 11A, *Gorgias* 447C–448, and *Protagoras* 361C.

In regard to (b), see *Charmides* 176A with 158E–159A; *Lysis* 223A; *Euthyphro* 5CD, 6DE, 15CD; *Theaetetus* 146–148D and 196DE; and *Laws* 965BE; cf. *Republic* 531E–532A and 534D; and *Greater Hippias* 286C, 288A, and 304DE.

those that apply so far as he is known or stipulated to be of some specific character, e.g., a man, person, or soul; and even so the necessary truths applying to him do not apply to him particularly, as truths only he *can* satisfy and distinguishing him from everyone else unmistakably.[23]

Moreover, knowing who Meno is is often, if not normally, understood to consist not in (1) knowing which particular man is called "Meno," but rather in (2) knowing Meno's relations, history, or character; and (1) is neither sufficient nor necessary for (2).[24] Socrates seems to be thinking of (2) rather than (1) in arguing that (a) is a mistake (i.e., that knowing who Meno is is presupposed in knowing facts about him), since it is just (1) that allows one to uphold (a) with any plausibility. So the reading suggested, although tempting, seems wrong.

But if the knowledge of Meno is to be understood along the lines of (2), then the analogy between it and the knowledge of virtue becomes misleading. You can meet with Meno and not know his name, but you cannot "meet with" (think of) virtue and not know its name (not know that it is virtue of which you think). You can meet with Meno and know his name and not know who he is (in the sense of (2)), and equally you can think of virtue and not know what it is (not know its essential defini-

[23] Cf. *Theaetetus* 208c–210a. Also, Aristotle, *Metaphysics* VII, 15.

[24] Insufficient in that, as you can meet Meno without knowing what he is called, so you can meet him and know his name to be "Meno" without knowing his relations, history, or character. And unnecessary in that you can know who he is (in the sense of (2)) without knowing which man has these relations, this history, and this character. For example, you may know that one of the fifteen guests at a dinner party, every one of whom you know socially, is, in fact, the notorious "Baron X" who has just published his fascinating memoirs; and yet you may wonder which of these men he is. Again, you may know who this particular man is but not know his name, e.g., having forgotten it. Admittedly, one might *sometimes* have reason, even in these cases, to insist, "Yes, but you still do not know who he is." But normally this would not be so.

tion). However, although you can know who Meno is (2) and not know which particular man he is (1), you cannot know what virtue is and not know which particular character it is.

Furthermore, the last two points face us with the following difficulty. Let us suppose that virtue is wisdom, or the knowledge of good and evil. Now the character defining virtue will have its own name, "wisdom," as well as a complex description, "knowledge of good and evil." Thus you can think of virtue, of wisdom, and of the knowledge of good and evil, and know that each is what it is and not another thing and yet apparently fail to grasp that these three are one and the same. Nevertheless, wisdom and the knowledge of good and evil *are* virtue, they are precisely what it is: how then can you fail to grasp their identity? It is not merely as if you fail to grasp that this masked man is your old acquaintance Meno, for this conclusion may (although it need not) require more factual information than is presently available to you. The identity of virtue and wisdom can be discovered and proved by a priori reasoning, and indeed only so.[25]

The query, "How can you fail to know the complex thing as the apparently simple one?" invites the reply, "How can you know that they are the same if you do not *already* know this?" For if Socrates' analogy at 71c is sound, then you know nothing *about* virtue from which to infer what it is unless and until you already know what it is; and if so, then what other way is there left in which to learn this?[26]

Accordingly, his question, "And how can I know a property of something when I don't even know what it is?" (71B), forces upon us the very question that Meno raises, "How can

[25] Cf. the puzzles about intellectual error in *Theaetetus* 188–191c and 195D–200c, which raise the issue, "How can you so much as think of something without knowing what it is?"

[26] Cf. Vlastos, "*Anamnesis* in the *Meno*," *op. cit.*, p. 156, n. 27.

I know what something is if I don't already know what it is?" (cf. 80DE). It is the right thing to ask, whether or not Meno himself knows what he is saying.

Socrates' reason for rejecting (b), the notion that you can know examples of virtue before you know what it is in and by itself, seems somewhat more straightforward. It amounts, if I am not mistaken, to the conviction that a general definition is needed as a guarantee of *univocal* predication, of knowing what you are talking about in predicating it of various cases (persons, actions, institutions, qualities, actual or possible, specific or general in description) as the same character or in the same sense. If you *know* that there is one character and one sense, then you can not only name it ("virtue") but can also state what it is.[27]

Meno begins by saying that it is easy to say what virtue is because there is a great variety and multiplicity of cases, each easily describable. He seems to think that it will consist in different characters in different cases, so that (for example) no two persons who have it need share any further features over and above virtue, each having it in his own way. It is not clear whether he thinks that virtue will be different in each person or only in each type of person; i.e., whether each virtue will belong (i) to at most one, or (ii) to anyone in a specific role or situation. On (i), anyone who had virtue would have only *his own* virtue and could not share it with another even in the same role or situation. But, in that case, how could he be said to share even virtue (although not, admittedly, his own virtue) with another? With what right could one say that it is *virtue* of which he has just his own exclusive share, and another, another? There could be no question of recognizing it in fresh in-

[27] The reading developed in this and the following four paragraphs was suggested to me by Richard Robinson, *Plato's Earlier Dialectic*, 2nd ed. (Oxford, 1953), chap. 5, esp. p. 57.

stances, nor even as the same in any given ones, for it would no longer be a character, the very being of which is to be common to many instances although identical with none of them. Stated generally, this view makes nonsense of all predication and intelligibility.[28] (ii) is barely more adequate, for if nothing need be common to all the types of instance, there is no reason to think that it is one character in them all which we mean by the word "virtue." It applies equivocally, like the word "bank" to an elevation by a river and to an institution for savings and loans. We might as well have as many different words as there are types of case, for these have no more affinity than do the Mississippi riverside and the Hanover Trust.

Socrates persuades Meno that virtue is at least *partly* the same in all cases, e.g., that it is partly justice and temperance (72–73C). But when Meno seems to define virtue as justice (73D) and lists other virtues (74A), Socrates complains that again we have only examples and not the definition of virtue: "In a different way we have discovered a number of virtues when we were looking for one only" (74A). This seems to mean: before (71E–72A) Meno multiplied it by saying that *the virtue of different persons is different*, and now he divides it by saying that *the virtue of any one person may be of different kinds*.[29] But neither move is of any use in determining what it is. The cash value of the first is that virtue is variously *instantiable;*

[28] Cf. Aristotle's view in *Categories*, chap. 2 ff., that the virtue (e.g.) of a particular man, that is, his own peculiar virtue, is "present in" him (being individual, one in number, and incapable of existing apart from him), but not "predicable of" him. What *is* predicable of him (because it is predicable of his own virtue) is virtue, but this is not present in him. For some problems here, see G. E. L. Owen, "Inherence," *Phronesis*, X (1965), 97–105, and the reply by R. E. Allen, "Individual Properties in Aristotle's *Categories*," in the same journal, XIV (1969), 31–39.

[29] Cf. *Parmenides* 130–131 for another attempt to multiply and divide a character.

that of the second, that virtue is variously *determinable*. Both imply, rather than give reason to deny, that virtue is one and the same in its instances and in its determinate forms.

The position that emerges from this and the subsequent discussion can be stated generally as follows:

> If several things, although different in various ways, are the same in respect of the character *F*, or if *F* is univocally predicated of each, then
>
> (1) this character *F*, whose presence makes them all the same and marks them off from everything else, is *one* character, ever the same: it is *what F* is;
>
> (2) it is *not* identical with any of these its instances: it is a character, something that can be common to, shared by, or predicated of many, something general rather than particular; and
>
> (3) it is *complex*, or intelligible, in that one can know and state what it is, and not simply name it and say that it is what it is and not another thing: one can identify it through other characters which it logically includes or excludes, or which logically include or exclude it. That is, one can identify it (say) as a complex character *GH*, such that *F* is predicable of anything if and only if and because *GH* is. And since *GH* is what *F* is, *GH* is not another character over and above *F*, but the *same* one stated in a formula providing both its analysis and its criterion. (Hence if all and only *F*s are *GH*s, this is simply because all and only *F*s are *F*s.)
>
> In short, you cannot know the meaning, much less the truth or falsity, of predicating *F* as one and the same character, or in one and the same sense, unless you know what *F* is and can state it.

Now Meno is prepared to assume, in the case of *being a bee*, *health*, and *strength* (72BE), that the many *F*s *are* all cases of precisely the same character and are not just homonymously called *F*s, so that *F* is something, some one thing, whose nature

is recognizable and distinct from any particular exemplifying it. And after some initial reservations about virtue (73A), he seems persuaded even in this case (73BD, 75B, 77B, 78C). Accordingly, he appears to concede that (b) is a mistake, and that one does not really understand what a virtue or a virtuous man or action or practice are, nor that any quality is a virtue nor any man virtuous, and so on, unless one knows and can say what virtue is, wherever it appears.[30]

This position has often been misunderstood and regarded as much less reasonable than it seems to be. I shall now briefly mention and discuss three objections often urged against it, the first two rather less serious, I think, than the third.

(i) The ability to state a general definition of a character *F* is *not* necessary for knowledge that particular things are or are not cases of it. If anything, it is the other way around. For consider that Socrates himself relies on examples in order to illustrate, establish, and refute general definitions. Indeed, whether or not his own explanations of what definition is themselves amount to definitions of definition, the fact is he *also* gives examples, and expresses disappointment when Meno fails to catch on to them.[31] Thus he bears witness himself that you understand what a definition says of particulars, and whether it is true, only if you already know what particulars exemplify the character defined, so as to be able to assess what is said of them. In short, definitions are intelligible and decid-

[30] Cf. *Sophist* 218BC, 232A, 239C–240A, and *Republic* 475E–480A, 520C, and 534BD; also the contrast between the "safe and ingenuous" and the "smarter" theories in *Phaedo* 100B–105, the second in effect explaining what a specified character is.

[31] *Meno* 72AD, 74B ff., 77AB, and 79A. For a typical induction from cases, see 87C–89A, or *Charmides* 167B–168A, which begins "But consider how monstrous this proposition is, my friend. In any parallel case, the impossibility will be obvious to you" (167C). Cf. *Theaetetus* 146B–148D, *Statesman* 277D–278, and 285–286A, and *Republic* 368C–369A, 420BC, 427CD, and 434D–435. However, see also n. 26 above.

able only on the basis of prior, more authoritative knowledge of cases, and not cases on the basis of definitions.[32]

This objection, however, shows only that knowing what *F* is entails or includes knowing what kinds of things count as cases of it. It is crucial to see that this is not knowing of any *actual* thing that it is *F* or not *F* (it was not claimed that knowing the general definition suffices for that), but only knowing of any possible thing under what conditions it counts as either. This is not empirical knowledge that these and those actual things are *F*, but a priori knowledge that such and such kinds of things would be so. It can indeed be illustrated by the citation of actual examples, but equally it can be by that of purely possible ones:[33] and what these illustrate is knowledge of the application of the predicate "F," or of the determinate species of *F*, the forms its characteristic features may take. But knowing that these are specific forms of *the same* character is not only entailed by, but also entails, knowing what this character is in them all.

The objection may amount to a protest that we cannot always state what we know a character to be, that we cannot always hit upon a precisely synonymous one articulating its nature; and that, nevertheless, we manage well enough in everyday discourse (including even the learning and teaching of

[32] This objection is taken from the following: Ludwig Wittgenstein, *The Blue Book* (Oxford, 1958), pp. 17–20; John Wisdom, *Paradox and Discovery* (Oxford, 1965), "A Feature of Wittgenstein's Technique," esp. pp. 100–102, and "The Metamorphoses of Metaphysics," esp. pp. 68–71; Peter Geach, "Plato's *Euthyphro:* An Analysis and Commentary," *Monist*, L (1966), 369–382, esp. 371–372; R. W. Newell, *The Concept of Philosophy* (London, 1967), chap. 3, sec. 4; and Renford Bambrough, *Reason, Truth, and God* (London, 1969), chap. 1, esp. pp. 11–15.

[33] Cf. Roderick Chisholm, *Theory of Knowledge* (Englewood Cliffs, N.J., 1966), pp. 76–77, and the references therein.

language) without extensive use of general definitions. And it is true that we generally get by without explicit explanations of what we are talking about and often without words at all. But that simply shows that for most purposes we can get by without guarantees of univocity.

> (ii) A general definition of *F* through its necessary and sufficient conditions is not the only way of explaining what *F* is. For one can also do this by pointing out features that are logically connected with its presence without being its logically necessary or sufficient conditions, features that a priori count as reasons for thinking, or as evidence, that it is present, although not always conclusive or the only reasons or evidence. E.g., a cow characteristically has cloven hooves, four legs, four stomachs, and two horns.[34] These are features that usually make something a cow; and although it is not necessarily true that these are common and peculiar to everything that is called a cow, it is necessarily true that they are common and (if further specified) jointly peculiar to normal cows. This sort of explanation will often prove helpful to someone wanting to know what a cow is and to whom a Linnaean defining formula would be unintelligible. It can be an illuminating and useful definition without even setting up to be exhaustive or exclusive.[35]

[34] This example, and the objection, are based on John Wisdom, *Other Minds* (Oxford, 1952), "Other Minds IV," pp. 106–107. See also *Paradox and Discovery*, "Existentialism," esp. pp. 36–37; Newell, *op. cit.*, chaps. 3 and 4; Bambrough, *op. cit.*, chaps. 1 and 4; Ryle, *op. cit.*, pp. 45–46 and 171.

[35] Again, one can explain what *F* is by mentioning the typical *force* or *point* of predicating it in speech-acts. E.g., to call something good of its kind is often to praise it as a clear illustration of what it is to be of that kind; to call something obscene is typically to proscribe it. Such an explanation, however, does not of itself convey what the character so predicated is. Cf. G. J. Warnock, "Ethics and Language," in *The Human Agent*, Royal Institute of Philosophy Lectures, I (1966–67; New York, 1968), 196–209.

This objection shows only that knowing what *F* is entails or includes knowing its *characteristic* features, the possession of which normally, although not always, makes something a case of it. This presumably implies that something lacking one or more of the features may still count as a positive case because of its likeness, through the characteristic features of *F* that it does have, to the nuclear or paradigmatic cases that have them all. But of itself this is no objection to the Socratic program. For, by hypothesis, being *F* consists in being *such a thing as characteristically has GH*. The italicized phrase specifies what anything is *F* if and only if and because it is.

It is sometimes said that there need be no nuclear cases displaying all the typical features of *F*, in that the various cases need have no typical features in common and yet may all equally be cases of *F*. For example, there are many sorts of games, constituted games by different features no one of which need be common and peculiar to all cases (e.g., the aim of victory, rules, skill, chance, separation from normal pursuits, pleasure, and so on), although each is as much a game as any other. However, the point is not whether they are all rightly called games, but whether they are so called *univocally*, and not whether there actually are nuclear cases, but whether there *could* be. To state it generally, if each *F* is made to be an *F* by different features, then the question arises whether *F* is predicated of each in the same sense: whether they share one character or only a set of different ones with only the name in common (like the many banks, rents, rings, or bounds). The only assurance that we have even one "family" of characters, much less one character, lies in the possibility of a nuclear case that is *F* for every reason or in every sense any *F* is. The description of this paradigm will point to the sense of saying that there is at least one character in which the many *F*s are the same, viz.

being such as this ideal case, whose possession of *GH etc.*, makes it preeminently *F*.[36]

It is true that a description of the criteria of *F*, in this looser sense of reasons for predication, need not give the whole story about it in order to be useful. But it is no substitute for the story of what *F* is, when one is claiming to *know* that its predication for these various reasons is not merely correct but univocal.

A third and more difficult objection is this:

> (iii) If (1) every character is definable, and (2) you know what a character is only if you grasp its definition, and (3) you grasp this only if you know what the characters are that go to define it but that it does not define, then definition can neither end nor begin. It cannot end, for every definition involves characters that are definable, by (1), and it cannot be-

[36] Cf. Michael Simon, "When is a Resemblance a Family Resemblance?" MIND, LXXVIII (1969), 408–416.

Such a paradigm should be distinguished from the kind whose possibility makes us say that the many *F*s exemplify a single family of characters because it is by reference to the way in which this paradigm is *F* that the other ways of being *F* are explained. The latter belongs to the Aristotelian doctrine of "focal meaning": see *Metaphysics* 1003A33–B19 and 1060B31–1061B17; and G. E. L. Owen, "Logic and Metaphysics in Some Earlier Works of Aristotle," in *Aristotle and Plato in the Mid-Fourth Century*, ed. I. Düring and G. E. L. Owen (Göteborg, 1960), pp. 163–190. A family-resemblance predicate, like "game" or "knowledge," can perhaps be shown to signify a single character in every case; but a focal one, like "healthy," "medical," "being," or "good," will apparently signify a single character or any of a group of related ones different from but defined by means of it: although not chance homonyms with it, they are not its synonyms either. (Here what is predicated *does*, apparently, vary with the context.) Still, on this doctrine the *same* character will be predicated of each of the *paradigmatic* cases, and so if an Aristotelian asserts that good (e.g.) is predicable univocally of all good *human beings*, it will not be unreasonable to ask him what this is. Cf., however, *Politics* 1260A8–B5.

gin, for no definition is grasped until all its elements are, by (3). Yet if you cannot know the definition of a character, then you cannot know what it is, by (2). Consequently, if you ever do know what it is, it cannot be necessary that you know its definition.

More fully, (1) is the assumption that every character is *complex,* in that you can state what it is by reference to other characters; the complexity of its definition displays the complexity of the character. But these other characters which are elements of its definition are complex too, by (1), and you know what they are only if you grasp the definitions displaying their complexity, by (2), and you grasp these definitions only if you know their elements, by (3), and so on, it seems, forever. But if no character is definable except by completing an infinite series of definitions, which is logically impossible, then no character is definable, and, given (2), no character is knowable.[37]

To escape the conclusion that characters are unknowable, it seems that one must either abandon (1) and say that not every character is definable or is a complex of other characters, or else abandon (2) and say that a general definition of a character is not necessary for knowing what it is, or else abandon (3) and say that you can grasp a complex without knowing what all its elements are.

The first course would seem to involve taking some characters as simple or ultimate, perhaps as those by which all others are to be defined. And yet to say this is to see that to

[37] This seems to be the point of Bambrough's objection in "Universals and Family Resemblances," reprinted (from *Proceedings of the Aristotelian Society,* LXI [1960–61], 207–222) in *Wittgenstein: The Philosophical Investigations,* ed. George Pitcher (Garden City, N.Y., 1966), p. 194. Cf. Aristotle, *Posterior Analytics* 72b5–25, 84a30–b4, 90b23–27, and *Metaphysics* II, chap. 2, esp. 994b17–25; and John Passmore, *Philosophical Reasoning* (New York, 1961), chap. 2, "The Infinite Regress," esp. pp. 29–30.

define *F* by way of *GH* is logically to relate *G* and *H* to *F* and to each other, and so no longer to treat them as simple. For if *H* is the more inclusive character, and if *F* consists in *GH*, then *G* is and must be that part of *H* which *F* is, and *H* that whose part *G* has is *F*. This is not yet to say what *G* or *H* are, but it is a beginning, and it shows that neither is a pure nameable with no necessary features of its own.

The third course seems to involve saying that you can know that *F* consists in *GH* even if your grasp of *G* and *H* is less than complete. And yet if you do not already know what they are, how can you know that *F exemplifies* either, which is a condition of knowing that it is identical with their combination?

Accordingly, if the second course is not to be taken, and nevertheless the Socratic program is not to be given up, the conclusion seems inescapable that knowledge of characters is impossible, as there is nowhere for definition to get a foothold.

One might hope that the conclusion can be avoided by saying that the regress need not be infinite; after all, there need not be infinitely many characters, and so there is no reason why the series of definitions cannot reach an end; nor need it end in a set of indefinable characters, for it may turn back on itself so that ultimately some characters are defined by way of others that are defined by way of others still that the initial ones define.[38] Interdefinability is no intrinsic vice so long as the circle taken is sufficiently broad to be illuminating and there is good agreement about the connections made and about application to cases. Thus, for example, we manage well enough with epistemic terms (*know, believe, suppose, doubt, think, prove, refute*) or again with modal and logical ones (*must, cannot,*

[38] (3) as stated does not exclude this; it does not say that the defining characters need be undefined *simpliciter*, but only that they are not both defining and defined in the same definition. Note that this is questioned in what is said above about the proposal to deny (1).

consistent, contradictory, analytic, synonymous), and these constitute systems of mutually defined and yet useful if not indispensable terms.

But this is not really satisfactory. Even if there need not be infinitely many characters, nothing has been said to show there need be finitely many either, so of itself this point has little force. The suggestion that what characters there are may be interdefinable, forming a network rather than a set of threads extended to infinity or converging at one or more terminal points, is more promising. Yet it is unclear what is to show that the network as a whole, or in any of its parts, is actually *correct*. For the point of definition is to establish what is really meant by predicates like "bee," "healthy," "strong," "good," and the like, and if the correctness of definition is to be settled entirely by consensus about the points of connection and application to cases, then there is nothing further by which to check that consensus or by which to resolve any doubts or disagreements that remain: if we do not agree on what these terms mean or imply, then there *is* no one thing that they mean or imply, and so no question of finding out what we do not already know.

However, if the nature of bees, health, human goodness, and the rest is not just anything we suppose, or even explicitly agree in supposing, then the knowledge of it is not simply a kind of knowledge of our own intentions, but something latent or implicit to be discovered by reasoning.[39] And the question remains how this is to be done. Even if all characters *are* interdefinable, it remains to show how you can know the definition of any one of them until you can define them all. Thus even if you

[39] Cf. Michael Dummett, "Wittgenstein's Philosophy of Mathematics," reprinted (from *Philosophical Review*, LXVIII [1959], 324–348) in Pitcher, *op. cit.*, pp. 434–437. If you seriously doubt whether you can recognize necessity for yourself, then it is useless to suppose that you can recognize general agreement about it.

think of a character first under its simple name and then under its complex definition, how can you grasp the truth that they are one and the same character unless you *already* know their identity?

It therefore appears that Meno's question was the right one to raise, whatever exactly he meant by it, since there are issues about inquiry into essential nature irresolvable merely by applying the solutions found in the *Euthydemus* and *Charmides* to the stock fallacies about knowing what you do not know. As we saw, these solutions show at most that unknown truths are not necessarily unknowable and not that they are necessarily knowable; they take it for granted that you can know what you do not know because you can recognize contradictions and necessities and thus can know that which you do not know in case you chance upon it. Hence of themselves they do not resolve the issues created by Socrates' demand for a general definition of virtue, viz. Is there one? Can we know it? And why, after all, do we need to? It is well, therefore, to take another look at Socrates' actual answer to Meno and to consider how far it can be read as an answer to these issues.

IV. Recollection and the paradox again: inquiry and virtue

In the initial statement of the theory of recollection at 81, the reasoning seemed to be, roughly,

> Since the soul, being immortal (p), had prior knowledge of all truth (q), one can know (recollect) it (r), and must seek to do so (s).

In the restatement of the theory at 86AC, however, it seems to go,

> Since one can know (recollect) all truth a priori (r), the soul has always had prior knowledge of it (q), and so is immortal (p), and therefore one must seek to know it again (s).

At first blush, Socrates seems to be saying, "I have heard that, since pq, rs; and since r (for consider the slave-boy), q, and so p, and so s."[40]

If, however, he is speaking to the very questions about a priori inquiry that we have been studying, he may rather be saying, "I have heard that, since pq, rs; and indeed, if and because pq, then rs." In other words,

> If and *because* the soul is immortal (p) and had prior knowledge of all truth (q), one can know (recollect) it a priori (r), and must seek to do so (s), just as the divinely inspired tell us.

This is to read the later statement as confirming the earlier one and to take the possibility of a priori inquiry, not as a reason for belief in a prior life and immortality, but as explained and justified by that belief together with the doctrine that "all nature is akin," not expressly brought in at 86AC. If this reading is correct, then Socrates' theory amounts to the following:

> Since all nature is akin, and has all been known before, we can know what any character is, for each is bound to others by logical relations of mutual inclusion and exclusion such as the soul can recognize a priori and trace ever further. For what these characters are, or their natures, are there and are complex, or definable by way of others, independently of our belief

[40] Compare *Meno* 80DE and 85D–86B with *Euthydemus* 275D–277C and 295B–296D, and n. 9 above. It is possible that Socrates is giving Meno a bit of his own trick argument in return for the paradox, although also for heuristic purposes, viz. to arouse his curiosity and desire to seek the truth for himself: the conclusion may after all be true. Since the same words can express an implausible inference on one reading and a more plausible one on another, this purpose is consistent with the more serious one sketched below.

in their reality and of our present capacity to grasp and state them. The nature of any one consists in its logical relations with others, so that knowing what it is involves knowing something necessary about them.[41] Consequently we can get to know what it is by knowing something necessary about it and about them, even before we arrive at a complete grasp of any of them. Thus we can begin to seek virtue because we can recognize that (e.g.) it is and must be such as to include knowledge and happiness and to exclude teachability (merely) by precept and doing harm of any kind. Although no one ostensible insight need by itself amount to knowledge, so far as it remains less than reasoned conviction of what is true, it can be stabilized and converted to knowledge by recollection, i.e., by unfolding it through successive intuitions of the mutual kinship of these characters with still others, and so on indefinitely. And so, if we know even part of the nature of any one character, we can discover that of the rest.[42]

[41] Thus the explicit definition of any one character is an implicit definition of the others by which it is defined, and indeed any necessary truth is a partial definition of all the characters involved. Consequently, no character is absolutely simple.

Compare *Theaetetus* 201C–206B, a passage in which Plato criticizes the notion that the ultimate elements of all things are simple and unknowable: if a complex is all its elements, or is a new unity in itself, then it is in either case as much or as little knowable as they are; on the other hand, experience teaches us that we do know elements, e.g., letters or musical notes: we can recognize them and know what they are. Cf. *Sophist* 251–253, *Statesman* 277D–278, and *Parmenides* 137C–142A and 159B–160B, which suggest that this knowledge includes the ability to combine them with one another in statements as well as to distinguish them by name.

[42] Even if we cannot know any one character perfectly before we know them all, we *can* know any given one, indeed essentially. We can know *about* virtue or any other character before knowing perfectly what it is, through knowing something *necessary* about it. This means that there is something between unqualified knowledge and unqualified ignorance of it, viz. true opinion, modulable into knowledge through reasoning. It also suggests a condition of looking for virtue, of the sort anticipated at

Thus because of the kinship of all nature (the nature of) everything that is is intelligible, for it is articulated and unified by necessary truths that are there, whether or not we believe they are or can grasp them (as we cannot if we fancy that we already know the truth or that we cannot know it). And because of the immortality of the soul, (the nature of) everything that is is intelligible to us, for these necessary truths have always already been known and, although forgotten, are recognizable (indeed they are unmistakable, if we realize that we do not already know and are prepared to seek with courage and care). Accordingly, if for example, virtue is wisdom, then it *is* so not merely if and only if and because any particular man or community of men thinks it is; nevertheless, if and only if and because it is so, anyone who thinks that it is wisdom and searches bravely and wisely enough will discover the reason why, and so will eventually *know* it (and know that he knows it).

Socrates, therefore, need not be simply inferring immortality from our apparent capacity for a priori knowledge, but rather putting it forward, together with the kinship of nature, as a condition *sufficient* for the reality of that capacity.[43] That

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the close of section II above: Meno does not know what he is looking for, nor how to look for it, because he neither knows nor firmly believes any necessary truths about it. Cf. Aristotle, *Posterior Analytics* 93a17–33, 89b33–35 and 92b4–8.

[43] Sufficient but, as we shall see, apparently not necessary, even if the kinship of nature *is* necessary, and even if belief in kinship is necessary for the very attempt to exercise this capacity. Cf. the argument in *Sophist* 251–252C and 259D–260B that kinship (the blending of Forms) is presupposed in any discourse whatever, including discourse asserting or denying kinship. (Cf. 249C, *Theaetetus* 157AB, 181–183B, *Parmenides* 135AC, *Cratylus* 439B–440D, and *Phaedo* 76DE for related arguments.)

One might anticipate that any reason we can propose for believing that we can seek and get a priori knowledge is likely to be a belief (a) which is itself less certain than that we can successfully inquire, and (b) whose status as a *reason*, moreover, already involves the assumption

is, any reason to believe those who are divinely inspired and who say that the soul is immortal and has known all that is, and is perpetually reborn and in need of purification—and surely their words deserve respect—is reason to believe that we can recognize necessity and essence if we encounter it. Moreover, it is reason to believe that we must try to discover the truth, and the truth about virtue in particular. For if it is a duty to live in utmost purity, then it is a duty to acquire and exercise virtue, and this entails knowing what it is. Thus the moral duty to purify the soul entails a moral duty to inquire into what it is virtue to do and to be. Consequently, inquiry into virtue is not only possible but morally necessary.

However, even if this account of Socrates' theory is correct so far—that it is meant not merely to answer Meno's sophism about knowledge and to prove immortality, but to provide a reason to think that we both *need* to know what virtue is and *can* know it, and indeed that it is *there* for us to know (and define, or state as well as name)—there remains at least one other problem to resolve. Belief in this theory is said to be a sufficient condition of inquiry into virtue and is implied to be a sufficient condition of virtue itself: Socrates says that it "produces energetic seekers after knowledge" (81E) and that "we shall be better, braver, and more active men" if we believe it right to inquire, than if we think we neither can nor must do

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that we can do so. For we cannot set out to reason without assuming that we can know the truth; we cannot try to prove that we can know it without taking this for granted. We are about to see that, for Plato, even if we had no proof or reason to think that we can successfully inquire, we must inquire anyway (into, among other things, the possibility of such inquiry), in order to fulfill essential human needs (moral ones, fundamentally), and so we cannot dispense with the belief that we can succeed. Cf. Warnock, "Criticisms of Metaphysics," in *The Nature of Metaphysics*, ed. D. F. Pears (New York, 1960), pp. 124–141, esp. pp. 128–136, for an unusually lucid discussion of a similar doctrine in Kant.

so, so that it *is* right to inquire (86BC). There seem to be two claims here worth scrutiny:

> (A) belief in the duty (and our ability) to inquire into virtue will give us virtue; and
>
> (B) so there *is* a duty to inquire into virtue (and hence a possibility of our doing so).

Presumably (A) will be true if and only if, first, the conviction that one must inquire into virtue is not only sufficient for inquiry but necessary too (and Socrates has indicated that one will not inquire if one thinks that one need not or cannot); and second, inquiry into virtue, in its turn, is not only necessary for virtue (and virtue apparently entails having discovered what virtue is) but sufficient as well. So if the sufficiency of the first for the second, and of the second for the third, can be made good, it will follow not only that (A) is true, but also that inquiry *is* virtue or, at any rate, its acquisition. And then to explain how men come by virtue will be to explain how they come by the knowledge of it or how they inquire. As we have seen, that is a matter of recollection, requiring the (natural) capacity for self-controlled attention (practice) to directed and searching questions (teaching) leading to the a priori recognition and recovery of truth one has already known. Accordingly, the theory of virtue and the theory of knowledge will be one and the same.

But is belief in the duty of inquiry into virtue sufficient for virtue? And even if it is, would this be any reason to believe that one *must* inquire, even for one who is not already persuaded that one *can* do so? In short, is (B) true if (A) is?

We can get light on this from the arguments that follow, that virtue is knowledge (86C–89A), and then again that it cannot be (89D–100B).

The first argument, briefly, is this. Socrates proposes to

explore hypothetically the question whether virtue is teachable: if and only if (i) virtue is knowledge, then it is teachable; and if (ii) virtue is good ("a firm hypothesis for us" they agree at 87DE), then it *is* knowledge if and only if (iii) everything good is or entails knowledge. Now virtue makes us good and, since (iv) what *is* good *does* good (or, in other words, is beneficial, useful, profitable, advantageous, or leads to happiness or one's own good[44]), it makes us do good and thus itself does good (87DE). Our various assets, material and spiritual, do neither good nor harm in themselves, but only in their right or wrong use by the soul, or according as the soul is guided by wisdom or folly. Thus what *makes* good things do good is wisdom; and since (by ii and iv) virtue is and does good, what makes *it* do good is wisdom. So virtue is or entails wisdom; and since wisdom is a kind of knowledge, this ensures (by i and iii) that virtue is teachable.

Now inasmuch as this is a proof that virtue is or entails the knowledge of what does one good or makes one happy, everyone who realizes this will want to have it. For by the argument at 77B–78B, everyone wants to have things that do him good. Hence he will want to *know* or at least to have *true* opinion about what does him good. And this will not be simply anything that is fancied to be so (any more than what is worthy of love is simply anything that is loved: see the *Euthyphro* 10–11B). Thus anyone who grasps that "if . . . virtue . . . cannot fail to be beneficial, it must be wisdom" (88C) will want such wisdom as necessary and sufficient for his own good or happiness. Moreover, he will want virtue, too, if he has reason to think it is not only

[44] In *Symposium* 205A, Diotima tells Socrates that "the happy are happy inasmuch as they possess the good." And "there is no need for us to ask why men should want to be happy." She adds (206A) that "what we love is the good, and nothing but the good." (At 204AB she seems to state still another version of the paradox of inquiry. Cf. *Lysis* 218AB.)

sufficient for happiness but necessary too. However, Socrates does not pursue this, but instead proceeds to develop an argument that virtue is not knowledge after all.

He persuades Meno that a subject is teachable only if there are teachers and students of it, so that if it is not taught and studied then it cannot be. But he has often looked for teachers of virtue, among Sophists and politicians, and without success (89D–96D). Hence the goodness of good men is not teachable and is not knowledge. However, good men do good (because what is good does good: 87DE, 96E–97A, 98C, 98E) by giving right guidance (since right use or guidance is what makes things do good: 87E–89A, 97A, 98E). And just so long as they have true opinion about what is right, they will do as much good or give guidance as right as do those who know. Thus "the guide in public life is not knowledge" (99B): the great Athenian leaders have not become eminent and done great things from knowledge, or they could "make others like themselves" (99B), but rather from "good opinion" (99C) and without knowing what they say and do (99D), and so apparently by divine inspiration. Consequently, it seems that virtue comes neither by nature nor by teaching but by divine inspiration without understanding, unless one be "the kind of statesman who can create another like himself" (100B).

This result appears to be correct so far as it goes, but without explanation it is surely misleading. First, the principle that if virtue is not taught or studied, then it cannot be, is on all fours with the principle that if it is not known, then it cannot be and conflicts with the account of learning as recollection agreed upon only a few paragraphs earlier (86BC). Second, "can be taught" is crucially ambiguous as between "can be handed over from another, or inscribed by telling or persuasion" and "can be elicited by questioning by another or by oneself from within oneself, or recovered by recollection." (Cf. *Republic*

518BE.) Accordingly, one might challenge the claim that if neither Sophists nor good citizens teach virtue, then no one else can (96BC) by proposing that Socrates does or that it can at least be studied Socratically even if it is taught neither by inscription nor as yet by a Socratic questioner who already knows it perfectly himself. Finally, while Socrates does not deny that there have been and are good men in Athens (93AB) and that Themistocles, Pericles, and the rest were "good at politics" (93A) and did and said many great and successful things (99CD), he does not say that *they* were good men or gave right guidance nor even that they had true opinion about virtue, much less that their goodness consisted in true opinion. What they had, apparently, was "well-aimed conjecture" or "good opinion" (99C; compare our "public opinion"), and political virtue (93A) rather than virtue unqualified.[45] Now so long as one has true opinion, it will guide him rightly and make him guide others rightly (97AB). But since the Athenian politicians "cannot make others like themselves" (99B), they lack even moderately stable true opinion about virtue such as would enable them to teach or guide others to the truth about it. Thus it is purely by chance, or divine dispensation, and not by their own control that, having done well on any one occasion, they do so on any other or ever again (99A,D). A man who knew the truth about virtue, however, and who could guide others to it by reasoning would stand to these men as a substance to shadows: as a guide to virtue, he would stand to them as statesman to orator; as a guide to wisdom, as teacher to Sophist.[46]

[45] They come off rather poorly in the fuller discussion in the *Gorgias* 502D–503D and 513E–519D, for not having taught the Athenians virtue: not knowing the right use of, and hence misusing their own eloquence, they did not make the citizens better but worse. "Thus we do not know of any man who has proved a good statesman in this city," Socrates concludes at 516E–517A. Cf. 526AB, however, on Aristides.

[46] *Gorgias* 453–465D, 473E–474B, 520AB, and 521D: "I think I am one of

Accordingly, the conclusion stands that virtue entails knowledge and that inquiry into virtue is necessary for virtue.[47] But whether it is *sufficient* remains to be seen.

We saw a moment ago that Socrates seems to think that anyone who knows what does him good, or makes him happy, will want this and will seek it unless prevented. Now any reason to think that *virtue* is what alone makes one happy is thereby a reason to think that anyone who knows or believes this to be so will seek to get and will practice virtue unless prevented; and he will seek the knowledge of virtue as *inclusive* of the knowledge of happiness,[48] and as something he does not know and wants and needs to have. This knowledge of the good, or wisdom, will both entail and be entailed by virtue. For (a) wisdom will entail the knowledge that it is in getting and practicing virtue that one's happiness lies, and, since one wants happiness, one will do whatever virtue requires unless pre-

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very few Athenians, not to say the only one, engaged in the true political art, and that of the men of today I alone practice statesmanship." On the value of true opinion about virtue without knowledge, see *Phaedo* 82AC and *Republic* 506C, 534BD, and 619BD; on its divinity nonetheless (so far as it is *true*), *Republic* 366CD, 368A, and *Statesman* 309CD; on the value of what is popularly called political wisdom, *Republic* 492–493, 496, 514–520D; on the connection between knowledge and teachability, *Symposium* 196E, *Timaeus* 51DE, *Euthydemus* 292DE, and *Meno* 87BC.

[47] Professor Vlastos has suggested to me in correspondence the contrary view that the admission (at 97AB) that true opinion is sufficient and knowledge unnecessary for right action opens the way for a new (and unsocratic) doctrine in the *Republic* according to which the guardians' true opinion about virtue, secured by education *(paideia)* rather than by philosophy, suffices for virtue: see, e.g., 429–430B, and Vlastos, "The Argument in the *Republic* that 'Justice Pays,'" *Journal of Philosophy*, LXV (1968), 665–674, esp. secs. 7–8; and "Justice and Psychic Harmony in the *Republic*," in the same journal, LXVI (1969), 505–522, esp. n. 50.

[48] For an argument that these two knowledges are independent, see Gerasimos Santas, "The Socratic Paradoxes," *Philosophical Review*, LXXIII (1964), 141–164.

vented; and (b) wisdom will be entailed by virtue, since one can get and practice it only if one discovers what it is. Consequently, if one has virtue if and only if and because one has wisdom, then he will acquire the one if and only if and because he acquires the other.

If, therefore, Socrates supposes that a man is happy (has his own good) if and only if and because he has virtue (is and does good), and this if and only if and because he has wisdom (knows what good is), then he will suppose that inquiry into virtue, so far as this is the acquisition of wisdom, is sufficient as well as necessary for virtue and thereby for happiness as well. It "makes one better" (86c) in that it makes one virtuous, and so it makes one happy too.

That Socrates *does* suppose this in the *Meno* seems likely in view of 87b–89b and 77b–78b. And that he supposes precisely this in other, apparently earlier, dialogues could not be plainer. Three examples will suffice. In the *Gorgias*, it is explicitly argued that *only* virtue does one good, in that a man will be happy if and only if he has and exercises virtue, for only so will he "do well" (see, e.g., 506c–508c and 527).[49] Again, in the *Charmides* 171d–175a, we find an argument very like that of *Meno* 87b–89b, leading to the conclusion that the knowledge that makes us "act rightly and be happy" is "that of good and evil," which is "a knowledge of human advantage" (174cd).[50] Finally, in the *Apology* there are most emphatic as-

[49] 469b–481b argues that the wicked man is unhappy, and more so than his victim, especially if unpunished for his crime. Compare the program in the *Republic* of proving justice intrinsically more beneficial than injustice, in effect that justice is happiness: see the passages cited in n. 5, above. Also, *Crito* 44d and 48b.

[50] See *Euthydemus* 278e–282d and 288d–293a, *Laches* 192c–199, esp. 195bd and 199cd, and *Protagoras* 312c–314, 349–350c, and 358bd–361c, on the tie between virtue and wisdom and the knowledge of good and evil or right use. Cf. *Lesser Hippias* 372–376, esp. 375e–376b, for a sug-

sertions that virtue is happiness (30B: "goodness brings wealth and every other blessing"; cf. 41D: "nothing can harm a good man either in life or in death"); that inquiry, as the care of the soul, is a duty, and thus is part of virtue (28E, 29DE); and that inquiry is happiness, the best thing a man can do and that which alone makes life worth living (30A, 38A, 40E–41C). Inquiry, in short, not only is the condition of virtue and happiness, but also exemplifies both.

However, even if we can safely read the *Meno* too in this way, we must deal with the old contentions (A) and (B): How will believing that it is right to inquire be sufficient for virtue if our success is *not* presupposed, i.e., so far as inquiry is not so much as the *acquisition* of wisdom, but only the *attempt* to acquire it? And how precisely can the good that it does us to believe it right to inquire—viz. it makes us seek that which alone makes us virtuous and happy—be a *reason* to think that it *is* right, and even possible, to do so, if we are not already convinced that we must seek it or can find it if we do seek it?

This brings us to the heart of the matter. The explanation can only be, I think, that for Socrates one has a duty to acquire virtue and so to inquire into it, quite *independently* of the knowledge of the soul's immortality and the duty of purification that depends on this. We must and can inquire, if the soul is immortal. But even if it is not, and a fortiori even if we cannot prove that it is, we have a duty to purify the soul through wisdom and virtue, and so through inquiry.[51] And if we have

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gestion that the man who does evil willingly is wiser and better than the man who does it unwillingly, unless wisdom and virtue are knowledge of the right, and not merely the efficient, use of things; also *Republic* 331C–334A, 405–408B, and 445AB, and *Gorgias* 511B–513.

[51] In *Phaedo* 64–69D, Socrates speaks of virtue and wisdom as purification from passions and feelings, an ideal whose validity seems to be independent of our actual condition after death; at 107CD there is a suggestion that, even if the soul were not immortal, it would still demand our care

no proof that we can succeed in discovering the truth about virtue, we have no proof that we cannot (much less a proof that the soul is not immortal). If we can succeed, i.e., if the truth is knowable, then we have a chance to discover it if and only if we exert ourselves to do so. And if we try, then whether or not we succeed, we shall at least be performing our moral duty to *care* for the soul and for goodness and wisdom. For even to try to make this divine part of ourselves (as contrasted with the bodily part) as good and as wise as we can *is* virtue. So if we recognize this duty, we shall regard our very attempt to inquire as not only morally necessary but sufficient as well, i.e., sufficient for virtue and for the happiness that it alone brings.

In that case (B) holds good as well as (A). For (A) we shall have virtue if and only if we *seek* the truth about it and so if and only if we *believe* that we must and can seek it. And since in any case we must acquire virtue, (B) we *must* seek it.[52]

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to make it "as good and wise as it possibly can be"; see also 82D and 84AB. Again, at *Theaetetus* 176–177A, having claimed that we must become as divine (righteous) as possible, he remarks that the wicked do not realize that in doing injustice they grow less like the pattern of "divine happiness" and more like that of "godless misery," and "the penalty they pay is the life they lead" (176E–177A). Finally, in discussing the idea that death is total annihilation, at *Apology* 40CD, there is no hint that its truth might somehow invalidate the duty to inquire into oneself and one's knowledge or ignorance of the good.

52 Socrates warns against "misology" in the *Phaedo* 89C–91C, i.e., against a distrust of argument afflicting those especially who "spend their time arguing both sides" uncritically (90D). We must not doubt that there is such a thing as a valid argument, but we must recognize that "we ourselves are still intellectual invalids" and "must brace ourselves and do our best to become healthy" (90E). This seems to mean: it is right and wise to seek wisdom even if we do not know that we will or even can succeed in this search. Cf. Simmias' remark at 88BD. Also, Gulley, *op. cit.*, chap. 3, Conclusion, pp. 201–204; and Vlastos, "The Paradox of Socrates," *University, A Princeton Magazine*, No. 21 (Summer 1964), pp. 19–24, esp. pp. 21 and 24.

The force of this can perhaps be brought out by a brief consideration of two objections:

> (i) Isn't it as circular to say that virtue is the inquiry into virtue, or the (virtuous) attempt to acquire the knowledge of what virtue is, as to say that it is the power to acquire good things virtuously (78B–79A), or that it is to act with a part of virtue (79AC)?

This is a misunderstanding. Meno's statement was meant to formulate an identity; the present one, a predication. The point is that so far as inquiry into virtue is *getting* the knowledge of the good, it is both necessary and sufficient for virtue; so far as it is merely *seeking* that knowledge, even if it is only necessary and is not (known to be) sufficient for getting it, it does at any rate *share* in virtue.

> (ii) But we cannot know even so much as this unless and until we succeed *per impossibile* in acquiring this knowledge of virtue in and by itself and thus come to know that we know and do what is good.

This too misses its mark. For, once again, even if we have no proof that the truth about virtue is knowable, we have equally no proof that it is not; and all that follows is that, if we know anything about virtue, we will not know *that* we know it unless and until we arrive at a proof of the former kind (at the end of inquiry, when everything that is, and is knowable, is finally known). Unlike Meno, who could not look for virtue, not knowing what he was looking for because he had no unshakable true opinions about it, Socrates is able to claim unshakability for the opinions that the virtue we seek is and must be the knowledge of the good, the search for and possession of which will be necessary and sufficient for goodness and happiness. (Cf. *Gorgias* 508E–509C, 527.) We can be certain of this much at least, he thinks, before we have a complete and

perfect grasp of what virtue is in and by itself (and in its relation to the whole of essential nature). That we are far from such a grasp is perhaps Socrates' chief reason for denying that he himself knows what virtue is (71AB, 80CD) and a reason for saying that it is not taught (since "just as no one can give away what he has not got, so no one can teach what he does not know": *Symposium* 196E). Accordingly, we cannot yet in this strong sense *prove* that we know that which we do know about virtue, that is, that our reasoned convictions about it are also true.

Socrates' position, so understood, is not, of course, beyond criticism.[53] But if the present analysis is correct, it explains, I think, why he answers the trick argument about inquiry with the grand theory of recollection instead of treating it as the simple sophism it probably is for Meno. It explains why he suggests at 81DE and 86BC that (A) the belief in the duty of inquiry, even as the attempt to inquire into virtue, entails virtue, and that (B) this (in the absence of a disproof of our

[53] One might ask, for example, whether, so far from meeting skepticism about a priori inquiry into essential nature ("Can we know or prove *that* we know anything about what virtue is?") it only illustrates its force. Cf. Descartes' idea in the *Meditations* that it is certain that (a) clear and distinct perceptions are not only indubitable (while considered) but true, if and only if it is certain that (b) there is a good God who does not give me such perceptions of things that can ever prove false, i.e., conflict with other clear and distinct perceptions (for then some of the most convincing and conclusive perceptions I *can* have would be not only false but unrecognizably and incorrigibly so, and this a good God cannot permit). Critics wonder how, if (a) and (b) taken by themselves are not already certain, it can be certain, first, that (a) if and only if (b), and next, that (b), and finally, that (a). Descartes' answer seems to be that my only *reason for doubting* (a) is a reason for doubting (b); but that if I assume (a) then I discover that I have no such reason. An atheist, however, has no such certainty of what he knows, and so he knows nothing perfectly. See Descartes, *Philosophical Writings*, trans. and ed. Elizabeth Anscombe and Peter Geach (London, 1954), pp. 76–79, 93, 96, 105–108, 116, and 124. See also n. 43, above.

belief that we can succeed) is a reason to proceed searching with courage (indeed with all virtue). And it helps to display the continuity between the *Meno* and other dialogues. We can appreciate not only that all of Meno's definitions are right so far as they go (at least on Socrates' view), but also that his challenge was the right one to raise, even if it is likely to have been not insight but inspiration that accounts for his raising it.[54]

[54] I thank Helen Cartwright, Hugo Bedau, Richard Rorty, Gregory Vlastos, and Malcolm Brown for their comments on an earlier draft of this essay.

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